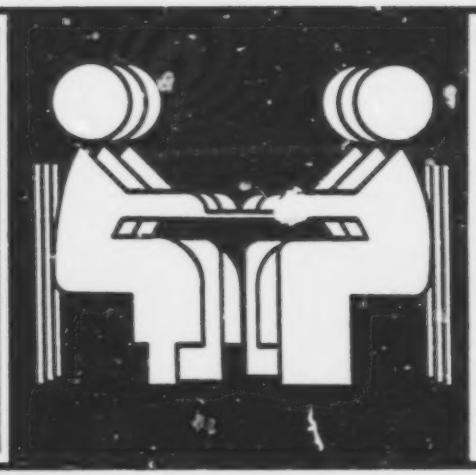
HE 20.3045/2: 975-85

S 17 1987

DRG
PEER REVIEW TRENDS



Workload and Actions of DRG Study Sections

1975 - 1985

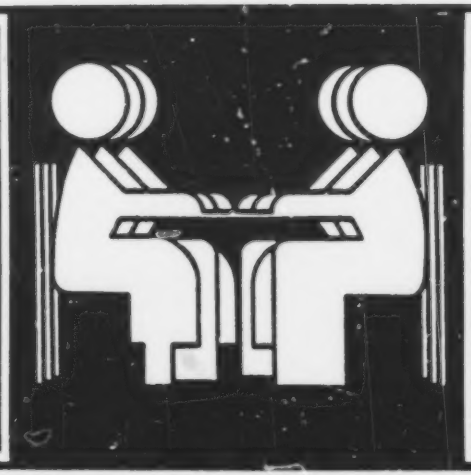
COMPLETED

ORIGINAL

BEST COPY AVAILABLE

Statistics and Analysis Branch
Division of Research Grants
National Institutes of Health

DRG
PEER REVIEW TRENDS



Workload and Actions of DRG Study Sections

1975 - 1985

Statistics and Analysis Brar
Division of Research Grants
National Institutes of Health

RELATED PUBLICATIONS

NIH PEER REVIEW OF RESEARCH GRANT APPLICATIONS
Copies of a set of slides designed to accompany lectures, presentations or seminars on the NIH peer review process. (1985)

PROCEEDINGS OF THE MEETINGS OF CHAIRPERSONS OF NIH SCIENTIFIC REVIEW GROUPS
Detailed record of discussions about the peer review system between the Director of NIH, his senior staff, and chairpersons of the NIH scientific review groups (1985).

NIH PEER REVIEW NOTES
Published periodically (usually prior to scientific review meetings) to inform NIH consultants and staff of developments related to DRG and Institute review policies and procedures.

DRG PEER REVIEW TRENDS: CHARACTERISTICS OF MEMBERS OF DRG STUDY SECTIONS AND OTHER REVIEW GROUPS, 1975 - 1984
Contains a series of charts and commentary describing 10 year trends in the characteristics of NIH peer review members.

19M: NIH NEW GRANTS AND AWARDS
Published quarterly; lists new awards arranged by state, city and institution. Includes title, grant number, dollars awarded and principal investigator.

FOREWORD

THE NIH SYSTEM OF PEER REVIEW draws on panels of recognized experts to provide technical advice and assistance in the review of research grant applications. The actions (approval and priority rating) of its initial review groups are the primary factor in the selection of the most meritorious research applications for NIH support.

LONG TERM TRENDS in both the workload and actions of the initial review groups managed by the Division of Research Grants (study sections) are the primary focus of this report. Recommended approval rates, priority scores and the subsequent success of applications are viewed in the context of an everchanging research climate. Although this report covers the years 1975-1985, some recently available 1986 data have been added to the text to show that trends featured in the graphs continue.

CHANGES IN national priorities and budgets, characteristics of applicants and applications, as well as in NIH review regulations are all examined for possible impact on initial grant review. Both applicants and reviewers are subject to the pressure of increasing numbers of worthy applicants competing for a stable number of supported projects. In addition, policy changes such as providing feedback to applicants or even an expansion of the rating scale can affect the overall review. The NIH peer review system must adapt to these changing conditions to provide a stable yet flexible system for the review of grant applications.

THIS PUBLICATION describes how these and other changes relate to the workload and actions of DRG study sections. The system itself is constantly under review by NIH extramural staff for potential improvements and, from time-to-time, these studies will be included in Peer Review Trends. Suggestions for changes and additions to this publication are welcome and will influence the content of future reports.

Joseph A. Brackett, Acting Chief
Statistics and Analysis Branch
Division of Research Grants, NIH

CONTENTS

	page
foreword	iii
contents	iv
technical notes	vi
list of charts	ix

1. WORKLOAD OF DRG STUDY SECTIONS 1
- Applications and requested support as percent of NIH total 2
- Number of applications reviewed by grant activity 4
- Number of R01 applications by type 6
- Increase in amendments 8
- Proportion of amendments 10
  - Result of increase in unfunded applications 12
  - Unfunded new vs. renewal applications 14

2. STUDY SECTION ACTION ON COMPETING R01 APPLICATIONS 17
- Mean priority score trends related to NIH review policy changes 18
- Approved applications: score distribution 20
- Shift in frequency distribution of priority scores 22
- Scores at selected percentiles and payline 24
- Mean priority score trends: R01 vs. other grant activities 26
- Requested vs. IRG recommended dollar support 28

3. APPLICATION CHARACTERISTICS (R01) RELATED TO STUDY SECTION ACTION 31
- Type application: new, renewal
  - Study section actions: disapprovals, score distribution 32
  - Trends in recommended approval rates 34
  - Trends in mean priority scores 36
  - Applications in fundable range 38
  - Frequency distributions of priority scores 40
- Requested years of support
  - Distribution of applications 42
  - Requested vs. approved years of support 44
  - Trends in mean priority scores 46
  - Study section actions: disapprovals, score distribution 48
  - Frequency distributions of priority scores 50
- Institute assignment
  - Number of applications 52
  - Study section actions: disapprovals, score distribution 54
  - Difference in mean priority scores 56

4. PRINCIPAL INVESTIGATOR CHARACTERISTICS RELATED TO STUDY SECTION ACTION 59
Degree of applicant
Number of applications 60
Distribution of applications 62
Study section actions: disapprovals, score distribution 64
Mean priority score trends 66
Age of applicant
Distribution of applications (total) 68
Distribution of applications (new, renewal) 70
Difference in mean priority scores 72
Sex of applicant
Distribution of applications 74
Difference in age 76
Study section actions: disapprovals, score distribution 78
Mean priority scores trends 80
Race/ethnic origin of applicant
Distribution of applications 82
Study section actions: disapprovals, score distribution 84
Difference in mean priority scores 86

5. APPLICANT INSTITUTION RELATED TO STUDY SECTION ACTION 89
Rank of institution (top 20 etc.)
Distribution of applications 90
Study section actions: disapprovals, score distribution 92
Type institution related to mean priority scores 94
Basic vs. Clinical departments (higher education)
Mean priority score trends 96
Department of applicant (higher education)
Mean priority score trends 98

6. DIFFERENCES AMONG STUDY SECTIONS 101
Mean priority score trends by Review Section 102
Difference in recommended approval rate 104
Difference in mean priority scores 106
Scattergram of 1980 vs. 1985 mean priority scores 108

TECHNICAL NOTES

1. THE NIH IMPAC DATA SYSTEM (Information for Management, Planning, Analysis, and Coordination) was the primary source of information for this report. IMPAC is a computer - based information system for PHS extramural programs and is maintained by the NIH Division of Research Grants.

2. FISCAL YEAR: Data in this report which relate to study section actions (i.e. priority scores or approval rates) are primarily compiled by fiscal year of Initial Review Group (IRG) meetings. From 1977 to the present, this includes the January, May and August/October council meetings of the indicated year; prior to 1977, it included March and May/June meetings of the indicated year plus the November meetings of the prior year. When data relate to funding of applications (i.e. success or award rates), they are compiled by fiscal year of appropriation for the funded applications or requested start date for the unfunded portion.

3. WORKLOAD STATISTICS in Section 1 refer to the applications assigned for review by DRG study sections. This is less than the total DRG workload which includes receipt and referral of applications to both DRG and Institute review panels. Sections 2-6 refer to the actions of DRG study sections and exclude applications that were either withdrawn by applicants, or deferred by study section action. Reviewed applications normally include both the original and amended application if reviewed in the same fiscal year.

4. THE CRITERIA FOR RESEARCH PROJECT REVIEW include scientific significance and originality; the design of the proposed research; the qualifications and experience of the principal investigator and staff; the scientific and administrative environment; relationship of budgetary estimates to the proposed work; the adequacy of proposed means for protecting against adverse effects on humans, animals or environment, where applicable.

5. REVIEW: Applications "assigned for review" by DRG study sections include applications that may be subsequently withdrawn or deferred. These are excluded from applications designated as "reviewed" by DRG study sections which require either recommendation for approval with priority score or disapproval.

6. APPROVAL: Based on the relevant criteria, the application is of sufficient merit to be worthy of support. A vote for approval is equivalent to a recommendation that an award be made provided sufficient funds are available. The recommendation can be for the time and amount requested or for an adjusted time and amount. A priority rating of 100 to 500 is required.

7. DISAPPROVAL: The application is not of sufficient merit to be worthy of support. Disapproval may also be recommended when gravely hazardous or unethical procedures are involved. No priority rating is given.

8. PRIORITY SCORES are the result of scientific and technical merit review of approved research applications and form the major determinant of funding decisions. Individual member evaluations range from 1.0 to 5.0, with 1.0 representing the most meritorious rating. Under laws governing NIH Advisory Committees, only regular members are permitted a vote on application quality (excludes ad hoc consultants). Votes were cast in 0.5 intervals until 1980. Since then, in order to achieve more precise scoring, voting was permitted in 0.1 intervals. The "raw" three-digit priority scores, which can range from 100 to 500, are the average of member votes multiplied by 100.

9. NORMALIZED SCORES were furnished (in addition to raw scores) by the DRG from November 1971 to May 1980 in an effort to promote comparability among the different study sections. These normalized standard scores represented the mathematical transformation of raw scores to a normal distribution having an overall mean of 250 and a standard deviation of 70; they were based on the scores voted by each individual study section for all approved applications at the last three meetings. Some Institutes used normalized scores while others retained the "raw" score as a primary basis for funding decisions. The use of normalized scores was discontinued in 1980 because of unresolved problems associated with their use, including the confusion induced by double scores (actual and normalized). In addition, normalization did not apply to ad hoc, special and small committees, or activities other than research grants.

10. PERCENTILING is a statistical mechanism currently used by most Institutes. Each study section's approved applications are ranked separately along a 100.0 percentile band according to priority score. The percentiling procedure results in a normalization effect among study sections, but without the transposition to a normalized score. The basic assumption of percentiling is that overall, the quality of approved applications is roughly equivalent among all study sections.

11. PAYLINE SCORES, for the sake of comparability, are expressed in terms of the 90th percentile i.e. the priority score of the funded application which ranks 90/100th among funded applications. The NIH believes it would be inaccurate to denote the payline as the score of the poorest funded application since some applications with relatively poor scores may be funded because of high program relevance. Applications near the cutoff score are closely screened for program relevance, duplication of effort etc.

12. CARRYOVERS are approved but unfunded grant applications that are kept active from one fiscal year to the next.

13. THE AWARD RATE FILE is a DRG computer file established in 1978 for the purpose of providing consistent award data for budget reporting and computation of award or success rates. In this file, amendments are substituted for the original application if submitted in the same fiscal year. This eliminates the distortion of award or success statistics that would occur if both the original application and its amendments were included.

14. SUCCESS RATE is the percent ratio of the number of competing applications to be funded divided by the total applications reviewed. Carryovers are included in both the numerator and denominator in the fiscal year they are funded. Applications that have one or more amendments are counted only once in computations. Success rates are influenced by a combination of factors including study section action, council recommendation, Institute program relevance/priorities and available funds. They are included for selected categories throughout this report.

15. AWARD RATE is the percent ratio of the number of funded applications (competing) divided by the total number eligible for funding (approved plus funded carryover). Carryovers are included in both the numerator and denominator in the fiscal year they are funded. Applications that have one or more amendments are counted only once in award rate computations.

16. SUMMARY STATEMENTS or "pink sheets" are the means by which the evaluations and recommendations of initial review groups are transmitted to the council and the institute; they also provide information to the applicant about the review of their application. They currently include a summary of comments and discussion by the initial review group plus the assigned priority score and percentile rank (if requested by the Institute). Numerous NIH policy changes have resulted in progressively furnishing more and earlier information to the applicant. Prior to 1979, review comments were only provided on request. Since 1984, summary statements have been released together with the priority score immediately after scientific review and prior to council review.

17. DRG DEPARTMENT CLASSIFICATIONS are an adaptation of the codes established by the AAMC. Basic science departments include anatomy, biochemistry, biology, biophysics, chemistry, genetics, microbiology, pathology, pharmacology, physics, physiology, zoology and other basic sciences. Clinical science departments include anesthesiology, dermatology, family practice, medicine, neurology, obstetrics, gynecology, ophthalmology, orthopedic surgery, otolaryngology, pediatrics, physical medicine and rehabilitation, psychiatry, public health and preventive medicine, radiology, surgery, and other clinical sciences.

LIST OF CHARTS

page

1. WORKLOAD OF DRG STUDY SECTIONS
   - NIH Support Requested by Competing Applications Submitted for DRG Study Section or Institute Review, FY 1985 — 2
   - Number of Competing Applications Assigned to DRG Study Sections, Fiscal Year of IRG Review 1975-1985 (selected years) — 4
   - Number of New and Competing Renewal R01 Applications Assigned to DRG Study Sections, FY 1975-1985 (selected years) — 6
   - Number of Original and Amended R01 Applications Assigned to DRG Study Sections, FY 1975-1985 (selected years) — 8
   - Amendments as a Percent of Competing R01 Applications Assigned to DRG Study Sections, FY 1975-1985 (selected years) — 10
   - Number of Competing R01 Applications by Funding Status FY 1965-1985 (selected years) — 12
   - Number of Competing R01 Applications by Funding Status and Type FY 1965-1985 (selected years) — 14

2. STUDY SECTION ACTION ON COMPETING R01 APPLICATIONS
   - Mean Priority Scores of DRG Approved R01 Applications Related to NIH Review Policy Changes, FY 1965-1985 — 18
   - Distribution of R01 Applications Approved by DRG Study Sections by Priority Score Interval, FY 1975-1985 (selected years) — 20
   - Priority Score Distributions of Competing R01 Applications Approved by DRG Study Sections, FY 1975, 1979, 1985 — 22
   - Priority Scores of Competing R01 Applications at Indicated Percentiles and Paylines, FY 1975-1985 (selected years) — 24
   - Mean Priority Scores of Competing Applications for Selected Grant Activities, FY 1975-1985 — 26
   - Requested vs. IRG Approved Dollar Support on Competing R01 Applications Reviewed by DRG Study Sections, FY 1975-1985 (selected years) — 28

3. APPLICATION CHARACTERISTICS (R01) RELATED TO STUDY SECTION ACTION
   - DRG Study Section Action on Competing R01 Applications by Type Application, FY 1975-1985 (selected years) — 32
   - Approval Rate of Competing New and Renewal R01 Applications Reviewed by DRG Study Sections, FY 1975-1985 — 34

Mean Priority Scores of Competing New and Renewal R01 Applications Approved by DRG Study Sections, FY 1975-1985 36

Competing R01 Applications Approved by DRG Study Sections: Percent with Scores Less Than 176, FY 1975-1985 38

Priority Score Distributions of Competing R01 Applications Approved by DRG Study Sections, FY 1975, 1979, 1985 40

Distribution of Reviewed R01 Applications by Requested Years of Support FY 1975, FY 1985 42

Percent Distribution of Approved R01 Applications: Study Section Action by Requested Years of Support, FY 1985 44

Mean Priority Scores of DRG Approved R01 Applications by Requested Years of Support, FY 1975-1985 46

DRG Study Section Rating of Competing R01 Applications by Requested Years of Support, FY 1975, 1980, 1985 48

Priority Score Distributions of DRG Approved R01 Applications by Requested Years of Support, FY 1985 50

Number of Competing R01 Applications by Assigned Institute, FY 1975 vs. FY 1985 52

DRG Study Section Action on Competing R01 Applications by Assigned Institute, FY 1985 54

Mean Priority Scores of DRG Approved R01 Applications by Assigned Institute, FY 1979 vs. FY 1985 56

4. PRINCIPAL INVESTIGATOR CHARACTERISTICS RELATED TO STUDY SECTION ACTION

Number of Competing R01 Applications by Degree of Applicant, FY 1975-1985 (selected years) 60

Distribution of Competing New and Renewal R01 Applications by Degree of Applicant, FY 1975-1985 (selected years) 62

DRG Study Section Action on Competing R01 Applications by Degree of Applicant, FY 1975-1985 (selected years) 64

Mean Priority Scores of Competing R01 Applications by Degree of Applicant, FY 1975-1985 66

Distribution of DRG Reviewed R01 Applications by Age of Principal Investigator, FY 1979-1985 68

Distribution of New and Renewal R01 Applications by Age of Principal Investigator, FY 1979, 1982, 1985 70

Mean Priority Scores of New R01 Applications by Age of Principal Investigator, FY 1979, FY 1985 72

Distribution of Competing New and Renewal R01 Applications by Sex of Applicant, FY 1975-1985 (selected years) 74

Distribution of Competing R01 Applications by Age and Sex of Principal Investigator, FY 1979, 1982, 1985 76

DRG Study Section Action on Competing R01 Applications by Sex of Applicant, FY 1975-1985 (selected years) 78

Mean Priority Scores of Competing R01 Applications by Sex of Applicant, FY 1975-1985 80

Minority Representation Among Competing R01 Applications Reviewed by DRG Study Sections, FY 1982-1985 82

DRG Study Section Action on Competing R01 Applications by Race/Ethnic Origin of Investigator, FY 1982 and 1985 84

Mean Priority Scores of Competing R01 Applications by Race/Ethnic Origin of Principal Investigator, FY 1982 and 1985 86

5. APPLICANT INSTITUTION RELATED TO STUDY SECTION ACTION

Distribution of R01 Applications Reviewed by DRG, by Rank of Applicant Institution, FY 1975 and 1985 90

DRG Study Section Action on Competing R01 Applications by Rank of Applicant Institution, FY 1985 92

Mean Priority Scores of DRG Approved R01 Applications by Type of Applicant Institution, FY 1975-1985 94

Mean Priority Scores of Competing R01 Applications from Basic vs. Clinical Departments , FY 1975-1985 96

Mean Priority Scores of Competing R01 Applications by Department of Principal Investigator, FY 1975-1985 (selected departments) 98

6. DIFFERENCES AMONG STUDY SECTIONS

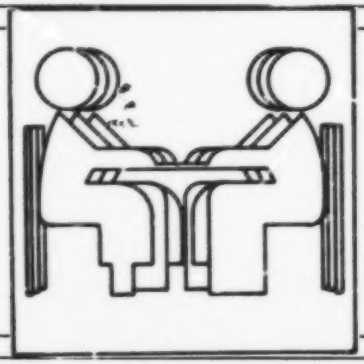
Mean Priority Scores of Competing R01 Applications by Review Section, FY 1975-1985 102

Percent Distribution of DRG Study Sections by Recommended Approval Rate of R01 Applications, FY 1975, 1980, 1985 104

Percent Distribution of DRG Study Sections by Mean R01 Score Assignments, FY 1975, FY 1985 106

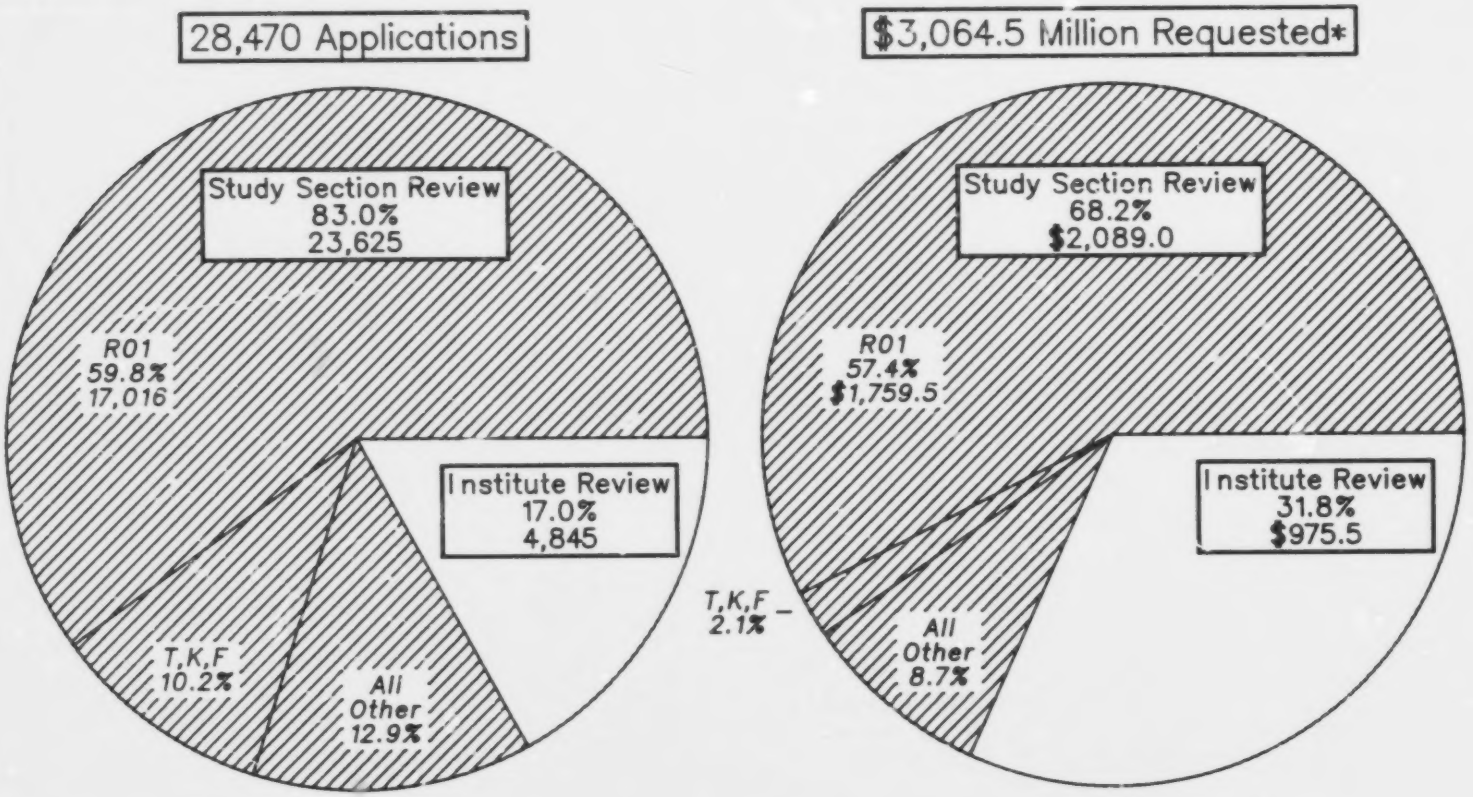
Relationship between Mean R01 Score Assignments of 48 DRG Study Sections: FY 1980 vs. FY 1985 108

BLANK PAGE



1. WORKLOAD OF DRG STUDY SECTIONS
   - Applications and requested support as percent of NIH total
   - Number of applications reviewed by grant activity
   - Number of R01 applications by type
   - Increase in amendments
   - Proportion of amendments
     - Result of increase in unfunded applications
     - Unfunded new vs. renewal applications

NIH Support Requested by Competing Applications*
Submitted for DRG Study Section or Institute Review, FY1985



*Summarized by fiscal year of IRG review. Direct cost requested in first year
Workload statistics include withdrawals and deferrals.
Source: NIH, DRG, Statistics and Analysis Branch

8706-W32

BEST COPY AVAILABLE

In FY 1985, 83 percent of the 28,500 competing applications submitted to the NIH (23,600) were assigned for review by study sections managed by the Division of Research Grants (DRG); the remaining 17 percent (4,800) were assigned to the various Institute review groups. The traditional research project (R01) accounted for about 60 percent (17,000) of total NIH competing applications and will form the primary focus of this report. In terms of requested dollar support, 1985 applications assigned to study section review accounted for 68 percent or 2.1 of the 3.1 billion dollars in requested support for the first year of competing applications.

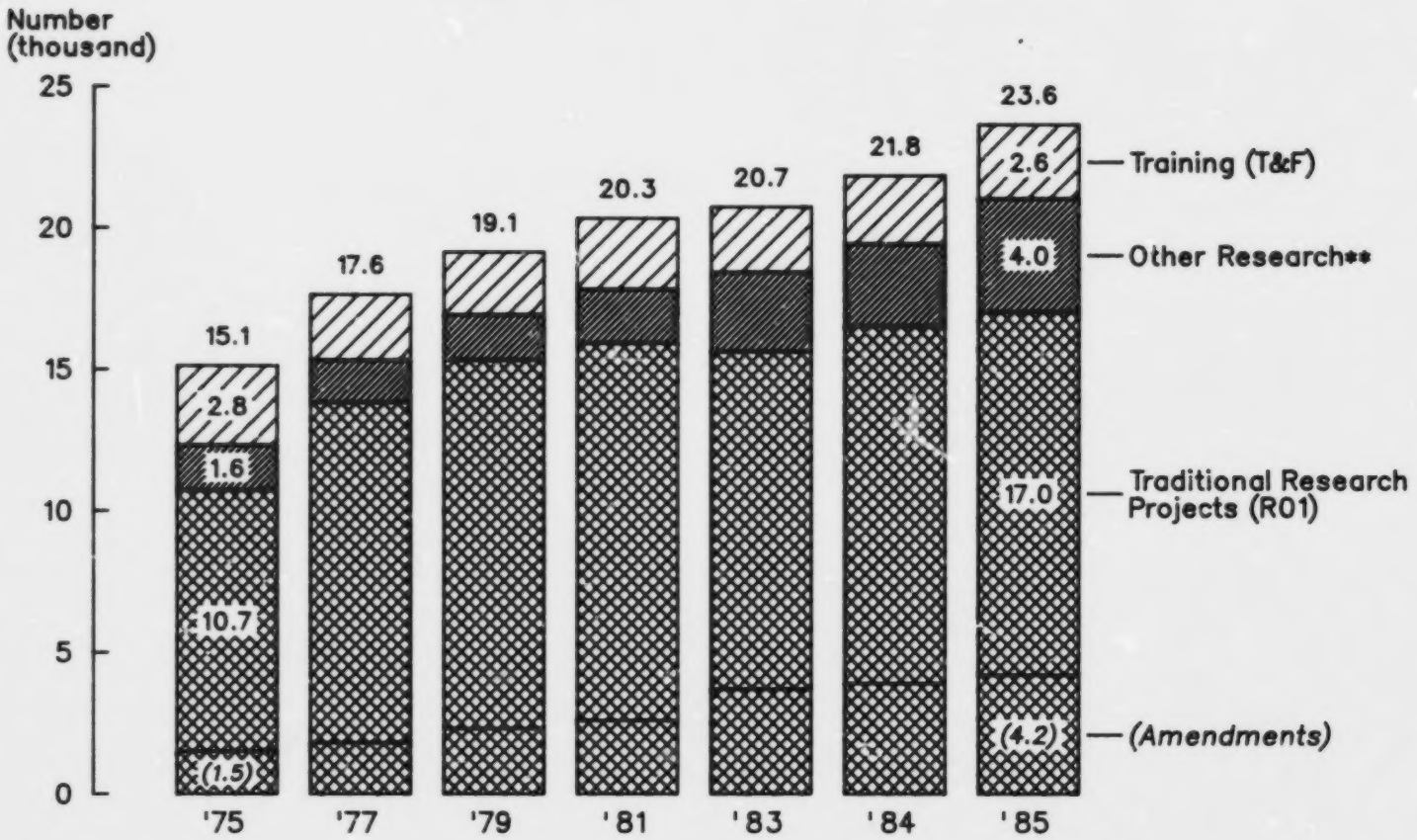
The decline in the proportion of applications assigned for DRG study section review since 1975 (6 percentage points) is due primarily to shifts in numerous smaller programs rather than a single program or policy change. Principal declines included Research Career Development (K04), and National Research Service Awards (F32, T32).

Increases in Institute review included Clinical Investigator Awards (K08), Physician Scientist Awards (K11), Small Grants (R03), Center Grants (P30, P40, P50, P60), Cooperative Agreements (U01), and applications submitted in response to Requests for Applications (R01). The percent distribution of NIH applications and their first year dollar requests are as follows:

	Applications*			Requested Dollars** (000)		
	1975	1980	1985	1975	1980	1985
DRG Review	89.3	88.4	83.0	71.8	72.1	68.2
R01	63.3	69.2	59.8	60.3	64.6	57.4
T,K,F	23.7	15.0	10.2	6.1	4.0	2.1
Other	2.3	4.2	12.9	5.5	3.5	8.8
Inst. Review	10.7	11.6	17.0	28.2	27.9	31.8
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number	16,916	21,105	28,470	963,070	1,696,291	3,064,486

*Workload statistics summarized by FY of IRG review.
**Dollars requested in first year (direct cost).

Number of Competing Applications* Assigned to DRG Study Sections
Fiscal Year of IRG Review 1975–1985 (selected years)



*Workload statistics include applications deferred, amended, or withdrawn prior to review.
**Other research projects, centers, and other research including career development.
Source: NIH, DRG, Statistics and Analysis Branch

8708–C32

BEST COPY AVAILABLE

Competing applications assigned for review by DRG study sections increased from 15,100 in FY 1975 to 23,625 in 1985--up 8,525 applications. About 1,800 more applications were received in 1985 than 1984. Traditional research project applications (R01s) increased from 10,702 in 1975 to 17,016 in 1985. Of this 6,300 increase, 2,700 or 43 percent was due to an increase in amendments (revised, re-submitted applications). Applications for other activities reviewed by DRG study sections increased by 2,225. Principal changes included increases in New Investigator Research Awards (R23), Small Business Innovation Research Grants (R43, R44), Academic Research Enhancement Awards (R15), and Biomedical Research Support Shared Instrumentation Grants (S10). These were partially offset by declines in Career Development Awards (K04) and National Research Service Awards (T32, F32).

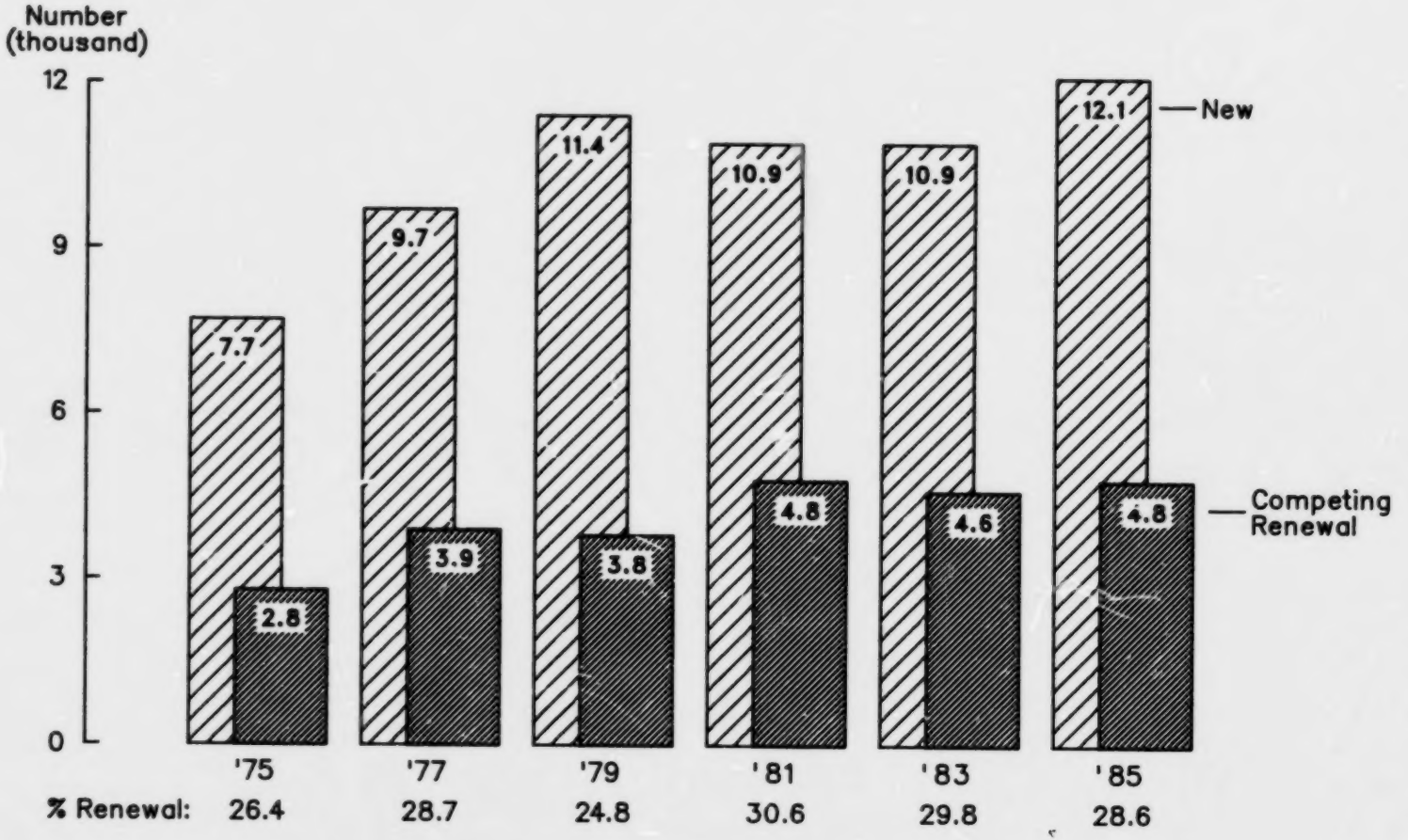
	Number of Applications*			
Activity	1975	1981	1984	1985
Trad. Res. (R01)	10,702	15,920	16,455	17,016
Other Res. Proj.	211	1,280	2,132	2,740
Research Centers	53	28	42	46
RCPAs (K)	1,219	421	356	348
Other Research	117	89	417	909
Training	324	65	66	30
Fellowships	2,473	2,457	2,356	2,536
Total	15,099	20,260	21,824	23,625
Amt. Req.-1st Yr ($000)	691,294	1,500,436	1,891,856	2,089,007

Summarized by FY of IRG review.

*The above statistics include about 1000 applications per year which are subsequently deferred or withdrawn. These are excluded from other statistics in this report which deal with actions of study sections (sections 2-6).

	1975	1981	1984	1985
Withdrawn	333	423	531	500
R01	215	241	352	309
other	118	182	179	191
Deferred	605	553	431	407
R01	501	471	311	301
other	104	82	120	106
Total	938	976	962	907

Number of New and Competing Renewal R01 Applications* Assigned to DRG Study Sections, FY 1975–1985 (selected years)



*Summarized by fiscal year of IRG review; excludes supplements; workload statistics include withdrawals and deferrals.
Source: NIH, DRG, Statistics and Analysis Branch

8706–W30

BEST COPY AVAILABLE

New R01 applications assigned to DRG study section review increased from 7,701 in 1975 to 12,053 in 1985, up 56 percent. Much of the increase (38 percent) occurred prior to 1980 with submissions showing smaller increases since 1980 (except for a decrease in 1983).

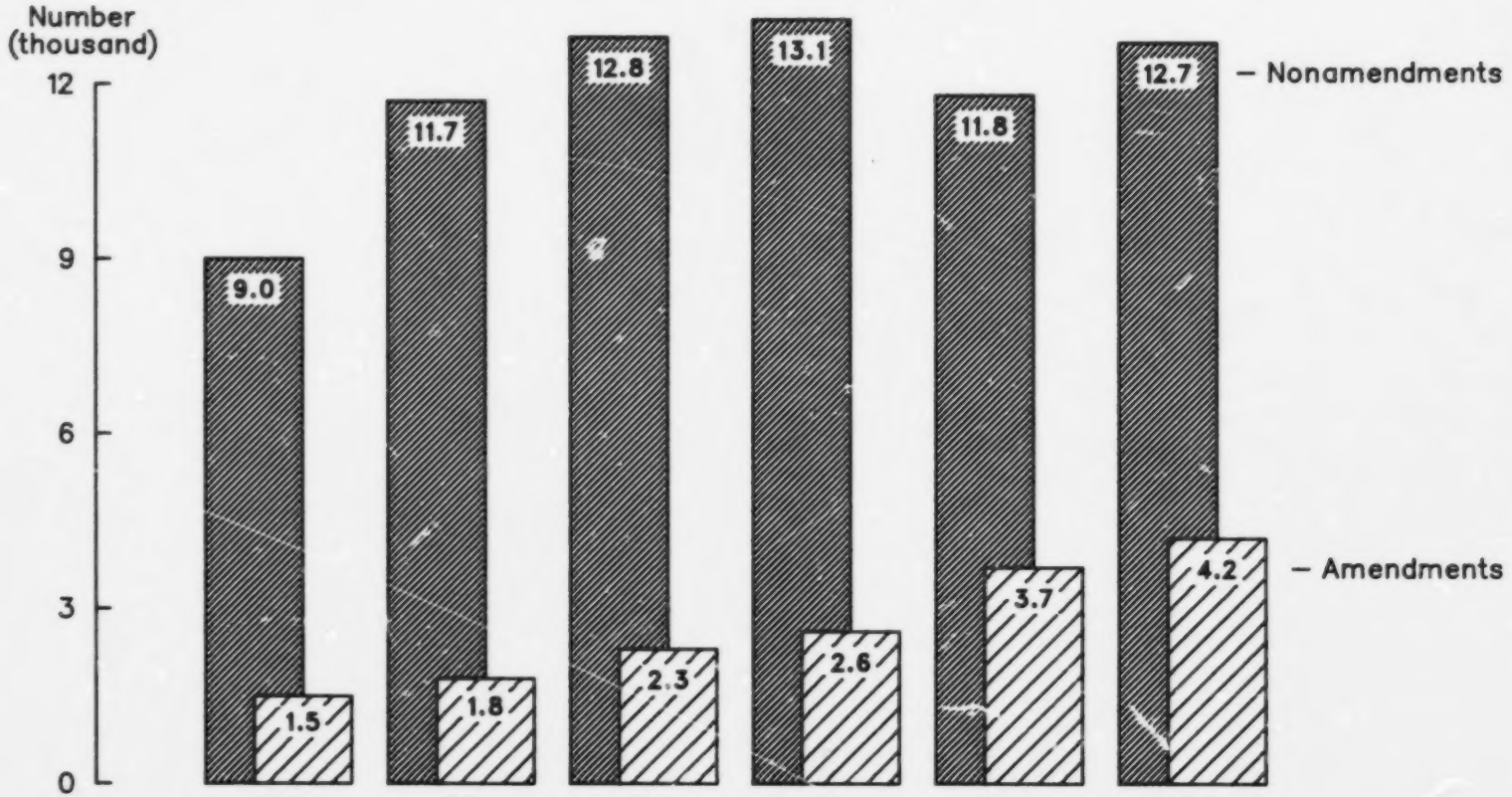
Competing renewals rose proportionately more -- by 75 percent -- from 2,756 in 1975 to 4,838 in 1985. They followed a pattern similar to new applications if an allowance is made for an expected 3 year lag in renewals. Almost 3 of every 10 R01 applications are competing renewals. The latest 1986 data show a jump in the proportion of competing applications that are renewals due to a drop in new submissions.

	Total*	New	Competing Renewal	
			Number	Percent*
1975	10,457	7,701	2,756	26.4
1976	11,973	8,914	3,059	25.5
1977	13,532	9,652	3,880	28.7
1978	13,977	10,050	3,927	28.1
1979	15,105	11,352	3,753	24.8
1980	14,323	10,656	3,667	25.6
1981	15,699	10,901	4,798	30.6
1982	16,290	11,156	5,133	31.5
1983	15,458	10,858	4,600	29.8
1984	16,314	11,543	4,771	29.2
1985	16,891	12,053	4,838	28.6
1986	16,015	10,472	5,543	34.6
1975-80	3,866	2,955	911	
1980-85	2,568	1,397	1,171	

Workload statistics summarized by FY of IRG review.
*Excludes competing supplements.

Much of the growth since 1980 was due to an increase in amended applications (page 8,10).

Number of Original and Amended R01 Applications*
Assigned to DRG Study Sections, FY 1975–1985 (selected years)



	'75	'77	'79	'81	'83	'85
Total:	10,457	13,532	15,105	15,699	15,458	16,891
% Amend.:	14.0	13.2	15.0	16.8	23.8	24.7

•Summarized by fiscal year of IRG review; excludes supplements; workload statistics include withdrawals and deferrals.
Source: NIH, DRG, Statistics and Analysis Branch

8706–W31

BEST COPY AVAILABLE

One of the major trends in the DRG review of R01 applications is the persistent increase in amendments to previously reviewed applications. Amendments have been primarily responsible for the continued R01 growth since 1979. Their 800 increase from 1975-1979 jumped to a 1,900 increase since 1979. This trend was seen in both new and competing renewal applications.

Conversely, the number of original applications (non-amendments) increased by 3,800 from 1975-1979 but showed only random fluctuation since 1979. A similar pattern was followed by both new and competing renewal applications. Recent 1986 data show a considerable decline in the number of new non-amended applications.

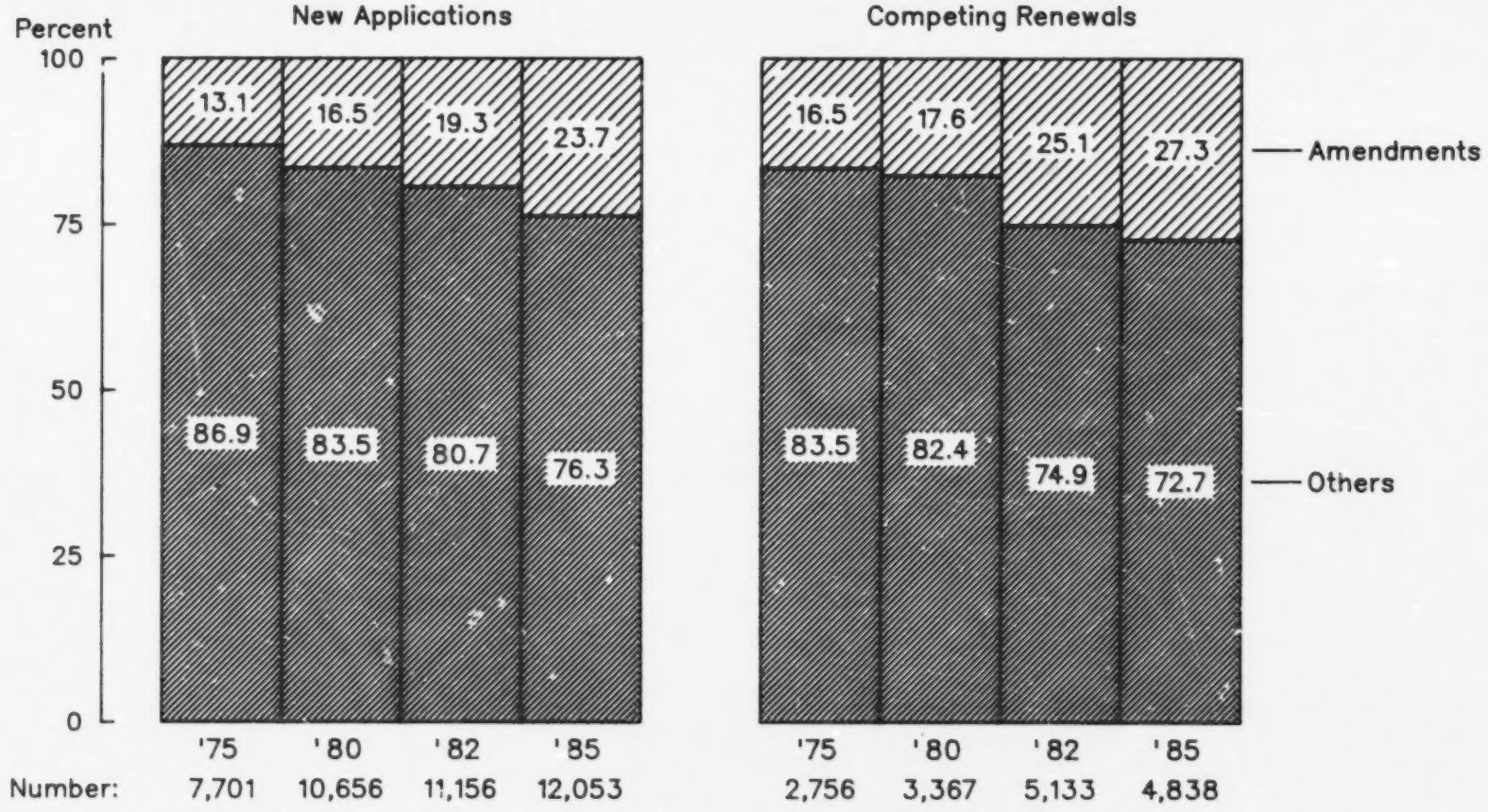
	Amendments			Non-amendments		
	Total*	New	Renewal	Total*	New	Renewal
1975	1,465	1,010	455	8,992	6,691	2,301
1976	1,561	1,133	428	10,412	7,781	2,631
1977	1,791	1,225	566	11,741	8,427	3,314
1978	2,434	1,595	839	11,543	8,455	3,088
1979	2,264	1,568	696	12,841	9,784	3,057
1980	2,402	1,758	644	11,921	8,898	3,023
1981	2,641	1,826	815	13,058	9,075	3,983
1982	3,435	2,148	1,287	12,854	9,008	3,846
1983	3,679	2,314	1,365	11,779	8,544	3,235
1984	3,856	2,608	1,248	12,458	8,935	3,523
1985	4,178	2,856	1,322	12,713	9,197	3,516
1986	4,359	2,800	1,559	11,656	7,672	3,984
1975-79	799	558	241	3,849	3,093	756
1979-85	1,914	1,288	626	-128	-587	459

Workload statistics include withdrawals and deferrals.
*Excludes competing supplements.

The proportion of second or third amendments to an R01 application has also increased. However, these multiple amendments (and therefore total amendments) are probably understated in the IMPAC data system by an unknown amount. In earlier years, DRG procedures permitted or even encouraged the re-submission of multiple amendments (particularly > 2) as new applications with new numbers.

	1975	1980	1983	1985
A - 1	88.2	90.8	83.5	79.7
A - 2	10.0	8.7	14.6	16.7
>A - 2	1.8	0.5	1.9	3.6
Total	100.0	100.0	100.0	100.0
Number	1,465	2,402	3,679	4,178

Amendments as a Percent of Competing R01 Applications* Assigned to DRG Study Sections, FY1975–1985 (selected years)



*Original and amended applications summarized by fiscal year of IRG review.
Workload statistics include withdrawals and deferrals.
Source: NIH, DRG, Statistics and Analysis Branch

8706–W27

BEST COPY AVAILABLE

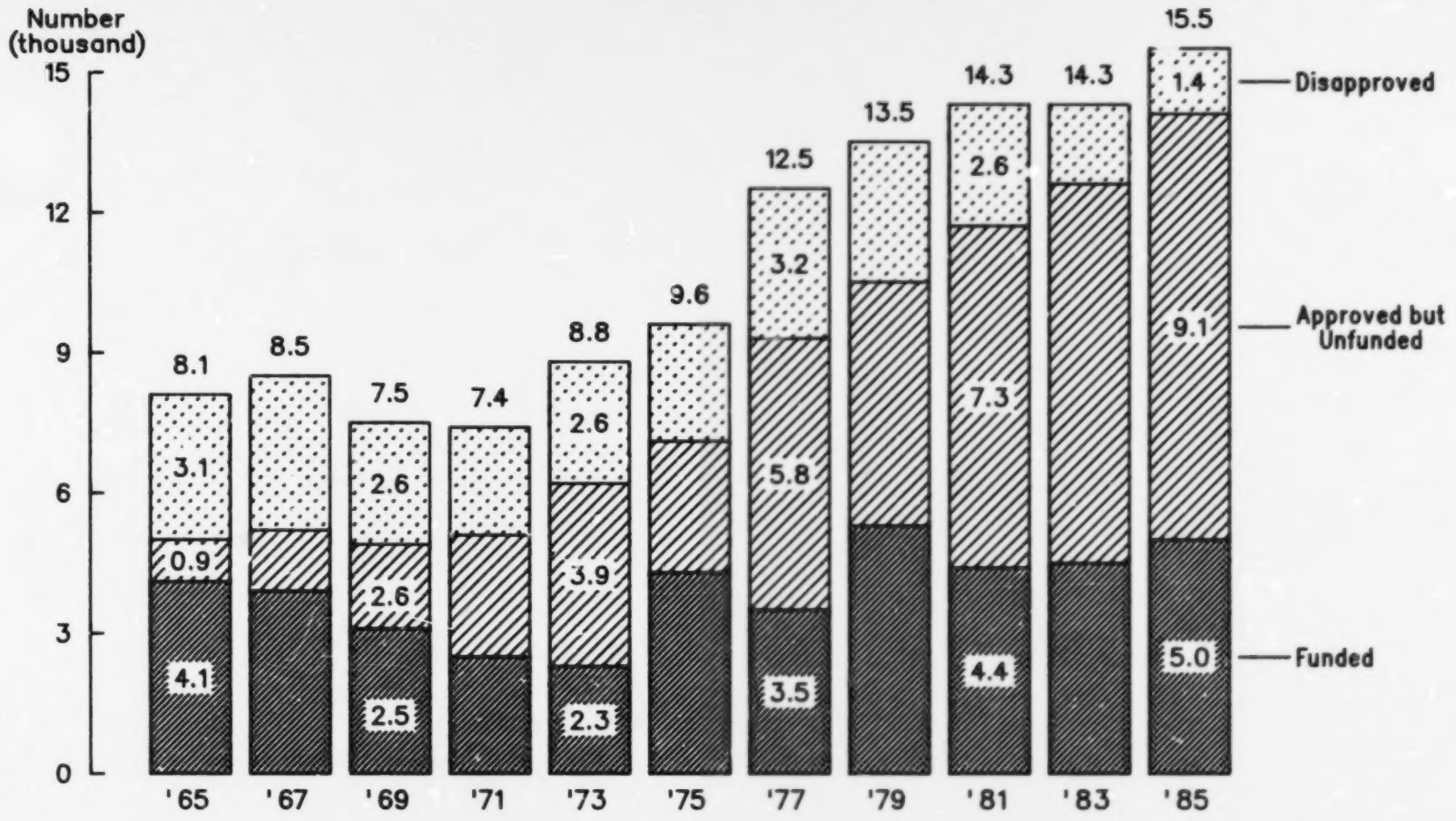
NIH policy changes since 1979, which provided progressively more and earlier feedback to applicants (on summary statements), probably contributed to the increase in amended applications. The proportion of R01 applications that were amendments showed a steady increase since 1976 -- 13.0 percent of processed applications in 1976 vs. 24.7 percent in 1985. An exception to this annual trend occurred in 1978 when the proportion of amendments exceeded that of the following three years. The increase in second or third amendments to an application (page 9) contributed to this trend but did not cause it. If these multiple amendments were excluded, then the percent of amendments would increase from 12.6 in 1975 to 20.8 in 1985 -- up 8.2 percentage points compared to the actual 10.7 point increase.

Amendments to new applications increased from 13.1 percent in 1975 to 13.8 in 1979 (+0.7 percentage points), and then jumped to 23.7 percent by 1985 (+9.9 points). Competing renewals had an even higher proportion of amendments as applicants sought to assure continuation of their NIH funding. Their amendments increased from 16.5 percent in 1975 to 18.5 in 1979 (+2.0 points), and then to 27.3 percent in 1985 (+8.8 points). Amendments played a major role in the increase in both new and competing renewal applications since 1979. Recent 1986 data indicate a continuing increase in the proportion of amendments.

	Total*		New Applications		Competing Renewals	
	Number	%A	Number	%A	Number	%A
1975	10,457	14.0	7,701	13.1	2,756	16.5
1976	11,973	13.0	8,914	12.7	3,059	14.0
1977	13,532	13.2	9,652	12.7	3,880	14.6
1978	13,977	17.4	10,050	15.9	3,927	21.4
1979	15,105	15.0	11,352	13.8	3,753	18.5
1980	14,323	16.8	10,656	16.5	3,667	17.6
1981	15,699	16.8	10,901	16.8	4,798	17.0
1982	16,290	21.0	11,156	19.3	5,133	25.1
1983	15,458	23.8	10,858	21.3	4,600	29.7
1984	16,314	23.6	11,543	22.6	4,771	26.2
1985	16,891	24.7	12,053	23.7	4,838	27.3
1986	16,015	27.2	10,472	26.7	5,543	28.1
1975-79	4,648	+1.0 pts.	3,651	+0.7	997	+2.0
1979-85	1,786	+9.7 pts.	701	+9.9	1,085	+8.8

Workload statistics summarized by FY of IRG review.
*Excludes competing supplements.

Number of Competing R01 Applications* by Funding Status FY1965–1985 (selected years)



*Summarized by requested start date or fiscal year of funds; Excludes withdrawals and supplements.
Includes funded carryover (except '65–'69). Data for '71–'85 from award rate file.
Source: NIH, DRG, Statistics and Analysis Branch

8706–W20

BEST COPY AVAILABLE

The combination of three trends -- increasing R01 applications, increasing rate of approval, together with a stable funding target resulted in large numbers of approved but unfunded applications. Despite a substantial increase in the number of competing R01 applications (9,647 in 1975 to 15,496 in 1985), the number that received NIH funding has remained relatively stable (4,282 increasing to 5,016). At the same time, the number disapproved by DRG study sections declined (2,451 down to 1,340). Approved but unfunded applications increased threefold from 2,914 in 1975 to 9,140 in 1985. Prior to 1976, the number funded frequently equaled or exceeded the number approved but unfunded; thereafter, more approved applications remained unfunded than have been funded. By 1985, 5,016 applications were funded, but an additional 9,140 applications were approved but not funded.*

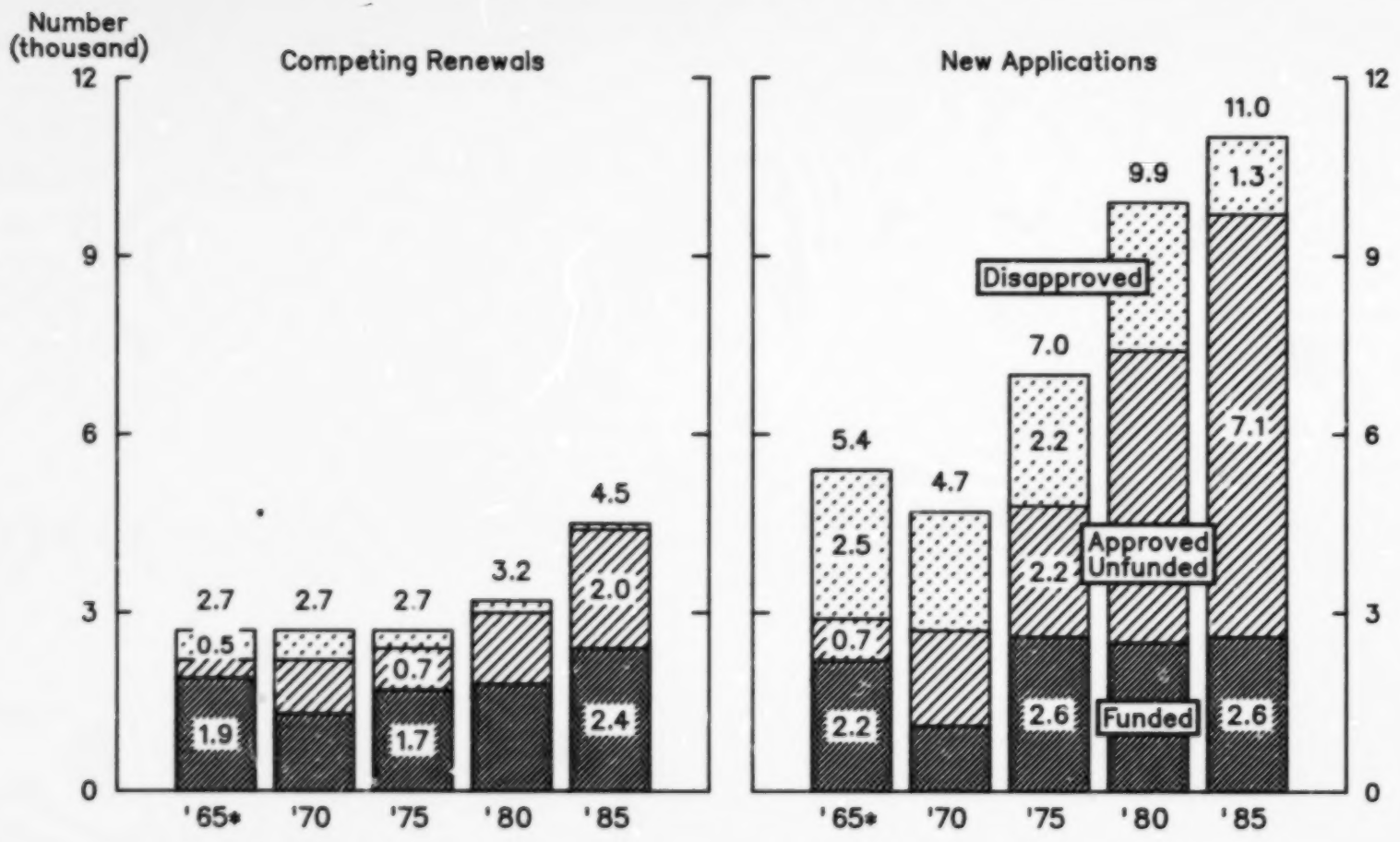
The present 2 to 1 odds against an R01 applicant being funded by NIH are bound to have an impact on both the applicant and the reviewer. Applicant reaction to the increased competition may result in the submission of more carefully prepared applications and consequently better approval rates and scores. The desire of the reviewer to increase the chance of funding for quality applications results in the assignment of better scores.

The most tangible result of poor funding odds is the increase in amended applications which boosted the already increased competition. By 1985, one fourth of the 5,016 funded applications were the result of amendments, compared to only 13 percent as recently as 1981. Applications which were eligible but remained unfunded included a similar proportion of amended applications since 1983.

	Total Funded*	Amendments No.	Amendments %	Eligible/ Unfunded*	Amendments No.	Amendments %
1970	2433	142	5.8	2479	266	10.7
1975	4282	521	12.2	2914	549	18.8
1979	5334	743	13.9	5208	971	18.6
1980	4263	518	12.2	6049	1212	20.0
1981	4447	596	13.4	7294	1402	19.2
1982	4341	754	17.4	8527	1887	22.1
1983	4542	1121	24.7	8033	2027	25.2
1984	4540	1035	22.8	8286	2015	24.3
1985	5016	1246	24.8	9140	2342	25.6
1975-80	+19	-3		+3135	+663	
1980-85	+753	+728		+3091	+1130	

*Summarized from award rate file by fiscal year of funding or requested start date.

Number of Competing R01 Applications* by Funding Status and Type FY1965–1985 (selected years)



*Summarized by requsted start date or fiscal year of funds. Excludes withdrawals and supplements.
Includes funded carryover (except 1965).
Source: NIH, DRG, Statistics and Analysis Branch

8706-W11

BEST COPY AVAILABLE

The number of approved but unfunded applications is especially striking among new submissions. In 1975, 2,200 of 7,000 new R01 applications (32 percent) remained unfunded; by 1985 this had increased to 7,100 of 11,000 applications (65 percent). The increased approval rate contributed to the appearance of large numbers of unfunded applications; if 1985 applications were approved at the same rate as 1975 (68 percent), the number of approved but unfunded new applications could drop to about 5,000 -- still large, but less than the 7,100.

Competing renewals also had a substantial increase in approved but unfunded applications, though not as dramatic because of their smaller number. In 1975, 700 of 2,700 competing renewal applications (26 percent) remained unfunded. They increased to 2,000 out of 4,500 (45 percent) by 1985. Increased approval rates had less effect on renewal applications because of their usual high rates.

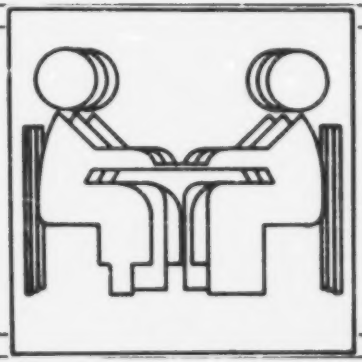
Preliminary 1986 data have been included below.

	New Applications			Competing Renewals		
	Funded	Eligible/ Unfunded	Disapproved	Funded	Eligible/ Unfunded	Disapproved
1965	2,155	749	2,540	1,881	275	530
1970	1,117	1,592	2,008	1,316	887	473
1975	2,595	2,223	2,170	1,687	691	281
1980	2,508	4,810	2,540	1,755	1,239	212
1982	2,209	6,159	2,105	2,132	2,368	187
1983	2,468	5,929	1,608	2,074	2,104	129
1984	2,441	6,270	1,470	2,099	2,016	102
1985	2,647	7,131	1,259	2,369	2,009	81
1986	2,393	6,938	883	2,299	2,217	44
75-80	-87	+2,587	+370	+68	+548	-69
80-85	+139	+2,321	-1,281	+614	+770	-131

By requested start date or FY of funds.

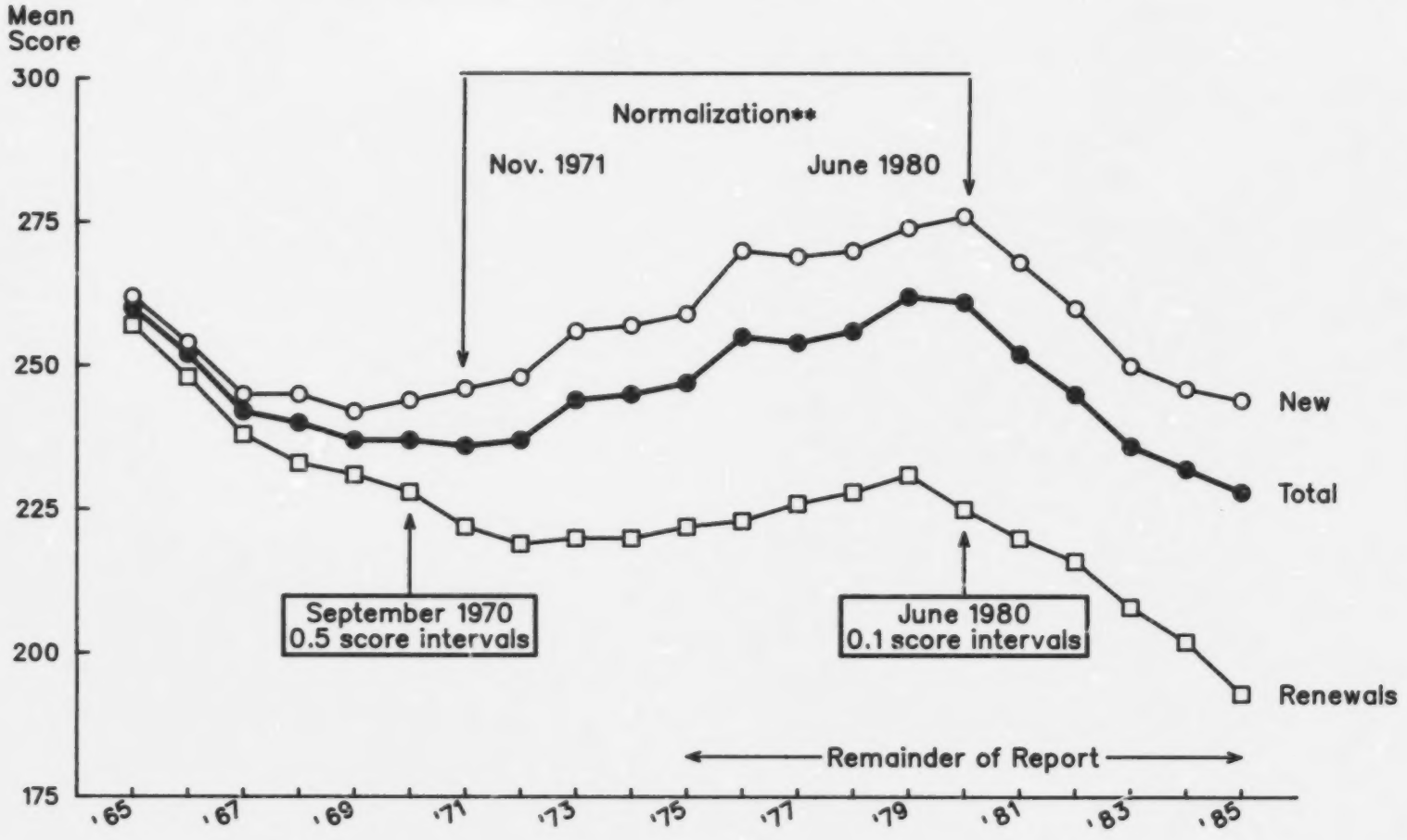
Data from 1970-1986 are from the award rate file in which amendments replace their original application if submitted in the same fiscal year.

BLANK PAGE



2. STUDY SECTION ACTION ON COMPETING R01 APPLICATIONS
   - Mean priority score trends related to NIH review policy changes
   - Approved applications: score distribution
   - Shift in frequency distribution of priority scores
   - Scores at selected percentiles and payline
   - Mean priority score trends: R01 vs. other grant activities
   - Requested vs. IRG recommended dollar support

Mean Priority Scores of DRG Approved R01 Applications Related to NIH Review Policy Changes, FY 1965–1985*



*Raw scores summarized by requested start date or fiscal year of funding; 1970–1985 from award rate file. **Normalization of scores limited to some institutes (AG, AI, CA, EY, HD, HL in 1978).
Source: NIH, DRG, Statistics and Analysis Branch

8706-W1

BEST COPY AVAILABLE

Mean priority scores are one of the most frequently used statistics to depict trends or comparisons in the review of competing applications. In order to provide additional perspective, this chart covers a 20 year period. Data from 1970-1985 are available from an award rate file which replaces scores of original applications with their amendments if they fall in the same fiscal year.

Priority score trends for R01 applications reviewed by DRG study sections can generally be separated into three periods: a decline in mean scores from 1965 to 1970, a steady increase from 1970 to 1980 followed by a rather sharp decline from 1980 to the present.

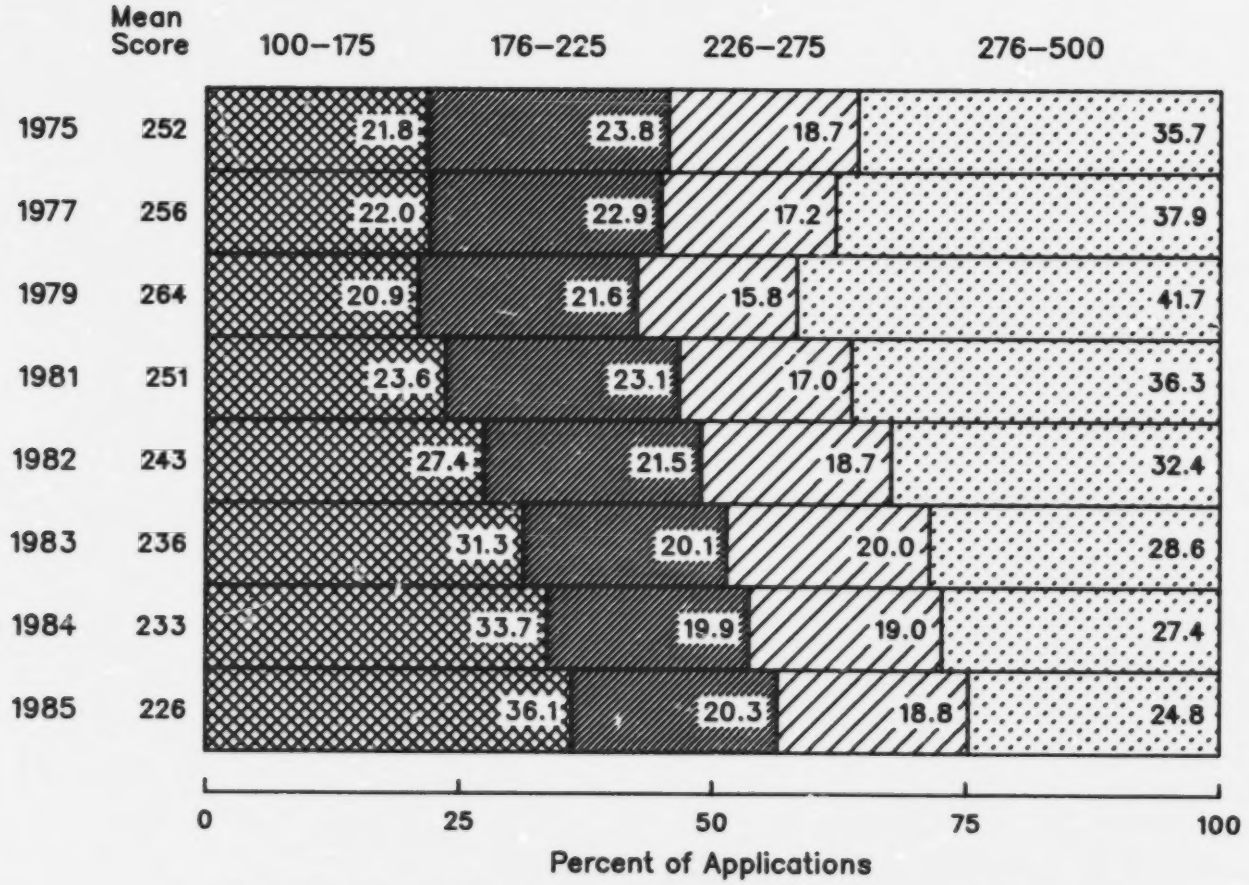
Any change in reviewing procedures has the potential for altering the trend in mean scores. For example, in an effort to ensure comparability among the different study sections, normalized scores were computed from November 1971 to June 1980 and were used in funding decisions by some institutes. This represented the mathematical transformation of raw scores to a normal distribution with a mean of 250 and standard deviation of 70. Although normalization is frequently credited with the upward trend in mean scores from 1971-1980, it is likely that much of this increase reflects the assignment of scores over 350 instead of disapproval. If mean scores include disapprovals (as 501), then the period from 1970-1980 shows a decline in the scores of new R01 applications reviewed by DRG instead of an increase. Competing renewals, with their higher approval rates had less increase in scores during normalization.

	New Applications			Competing Renewals		
	Mean (Approved)	Mean* (Reviewed)	Appr. Rate	Mean (Approved)	Mean* (Reviewed)	Appr. Rate
1965	262	373	53	257	305	80
1970	244	353	57	228	277	82
1975	259	336	68	222	252	89
1980	276	334	74	225	243	93
1985	244	273	89	193	198	98

*Reviewed mean scores include disapprovals as 501.
Summarized by fiscal year of funds or requested start date.

In order to permit more precise evaluation of applications, ratings were allowed in 0.5 intervals beginning in September 1970 and expanded to 0.1 intervals in June 1980. Although this change can affect the relative position of individual applications, it does not have the potential to influence overall score trends.

Distribution of R01 Applications* Approved by DRG Study Sections by Priority Score Interval**, FY1975–1985 (selected years)



*Original and amended applications summarized by fiscal year of IRG review; excludes withdrawals and supplements. **Uneven score intervals.
Source: NIH, DRG, Statistics and Analysis Branch

8706–W25

BEST COPY AVAILABLE

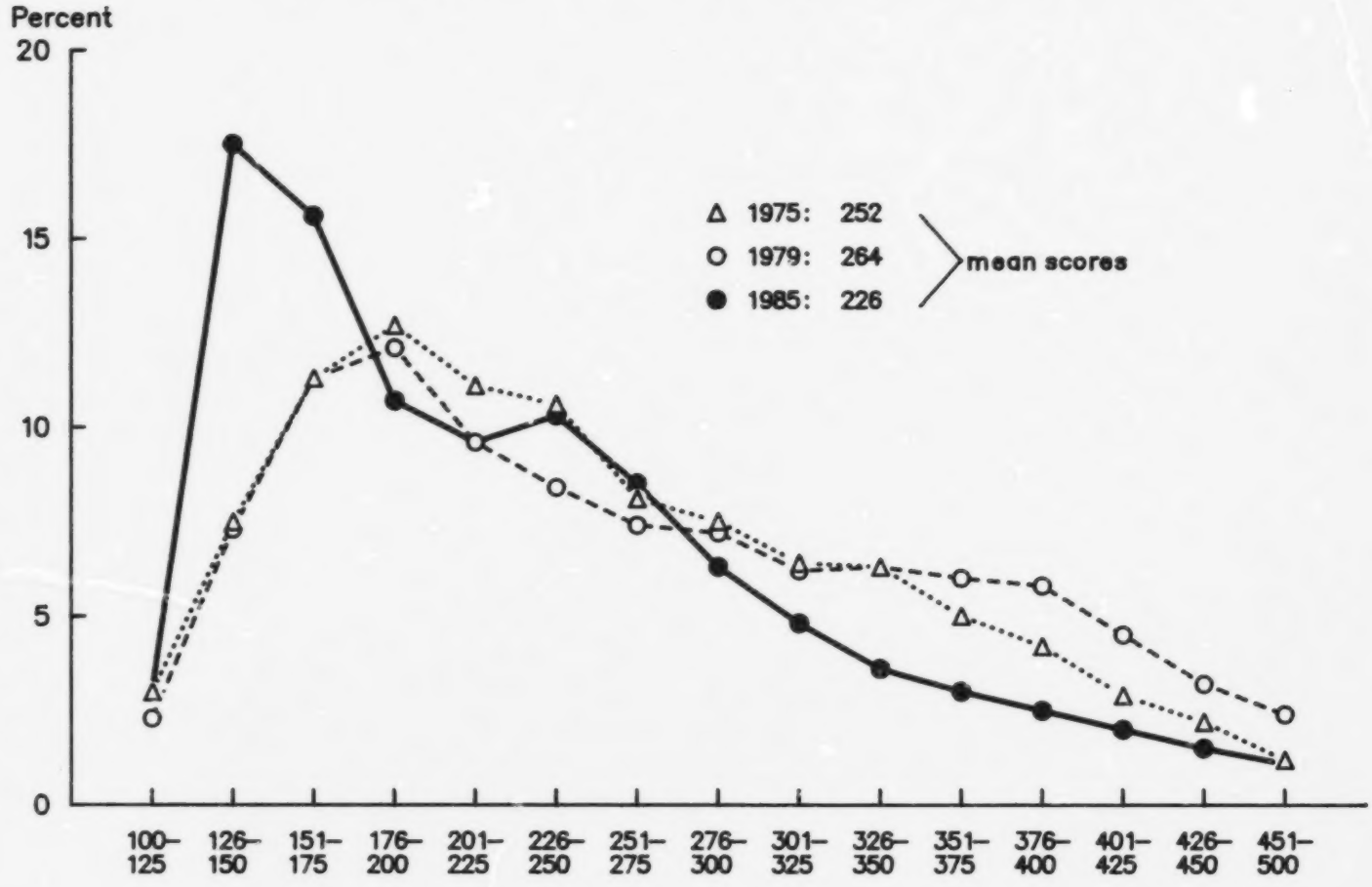
Another major trend in the review of R01 applications is the unmistakable change in the priority score distribution. A steady, annual increase in the proportion of R01 applications with scores of 100 to 175 has occurred since 1979. Applications receiving these top scores increased by 15 percentage points -- from 20.9 percent of approvals in 1979 to 36.2 in 1985. Two-thirds of this increase occurred in applications with scores 125 to 150. Recent data for 1986 indicate a further increase of scores 100-175 to 40.2 percent.

This shift does not represent just score improvement of marginally fundable applications (i.e. improvement of those 150 to 175). Rather, the changed distribution includes a general improvement across the total range of scores, with a declining proportion of applications found in the poorest score intervals as well as in the intermediate range. This is reflected in the corresponding decline in median scores since 1979 (page 25). Applications at the poorest half of the rating scale (scores 301 to 500) declined by 16 points from a high of 34.5 percent in 1979 to only 18.5 percent by 1985.

Scores	1975	1979	1985	1979-85
100-125	3.0	2.3	3.0	+ 0.7
126-150	7.5	7.3	17.6	+10.3
151-175	11.3	11.3	15.6	+ 4.3
176-200	12.7	12.1	10.7	- 1.4
201-225	11.1	9.6	9.6	0.0
226-275	18.7	15.8	18.8	+ 3.0
276-300	7.5	7.2	6.3	- 0.9
301-400	21.8	24.4	13.9	-10.5
401-500	6.4	10.1	4.6	- 5.5
Total	100.0	100.0	100.0	
Number	7,153	11,087	15,225	

The "across-the-board" nature of score improvement extends to the proportion of disapprovals which declined from 27.9 percent in 1975 and 22.4 in 1979, to only 7.7 in 1985 (page 33).

Priority Score Distributions of Competing R01 Applications Approved by DRG Study Sections, FY1975, 1979, 1985*



*Summarized by fiscal year of IRG review; excludes withdrawals and supplements.
Source: NIH, DRG, Statistics and Analysis Branch

8706-W24

BEST COPY AVAILABLE

The principal change between 1975 and 1979 R01 score distributions was an increase in scores over 350 -- up 6 percentage points from 15.5 to 21.9 percent. Changes during this period appear closely related to an increase in approval rates from 72 to 78 percent. If score distributions include disapprovals combined with scores over 350, then distribution changes from 1975-1979 are minimal.

The substantial shift toward priority scores of 175 or better since 1979 is clearly seen in these distributions. The largest change was in scores of 126 to 150 which increased by 10 percentage points from 7.3 TO 17.6 percent of approved applications in 1985. A smaller increase of 4 percentage points occurred in scores 151 to 175 .

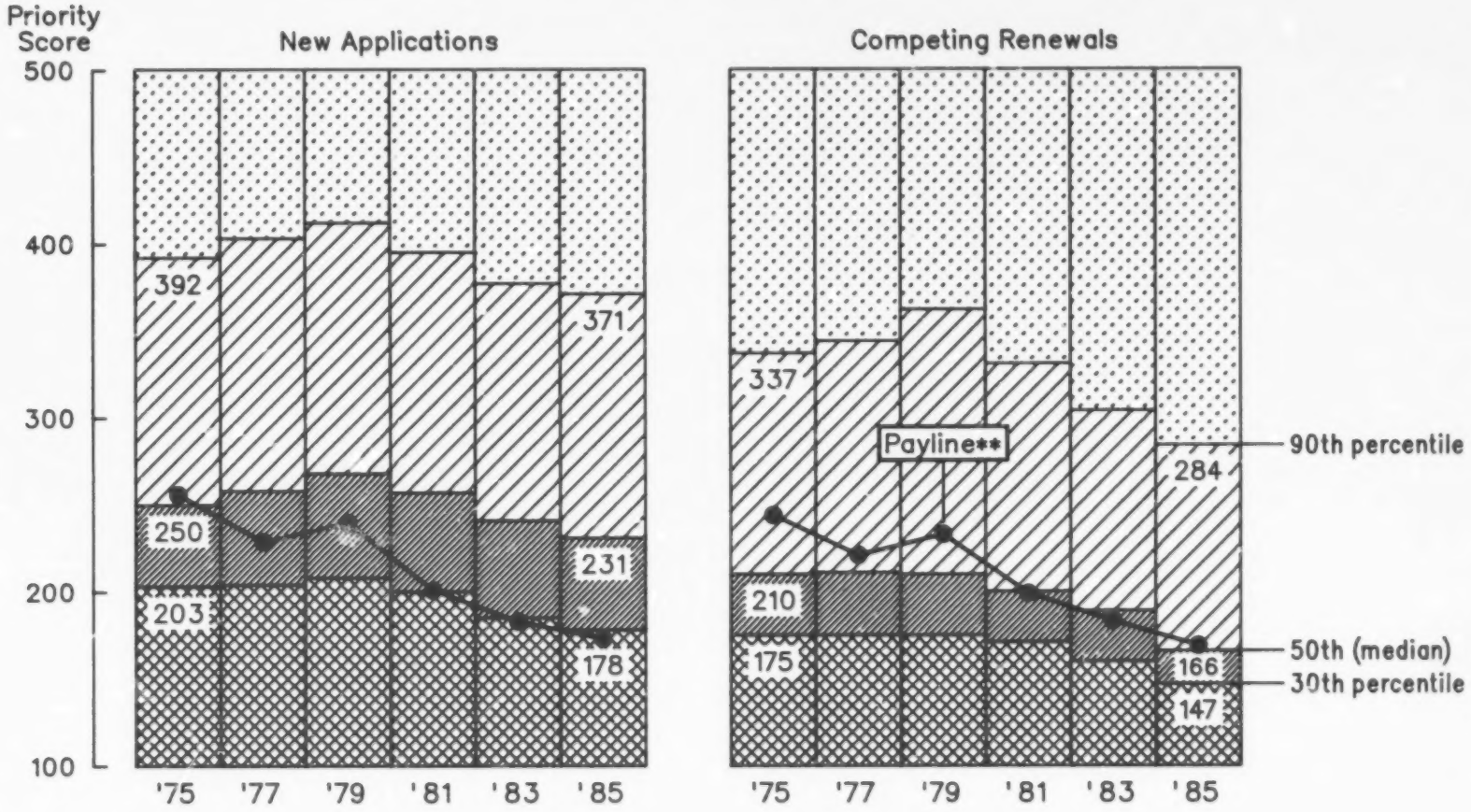
Reasons for this shift in scores probably include the desire by review panels to influence further the funding of recommended applications. As cutoff scores decline, reviewers scores also decline in order to indicate their judgment of application quality.

	Score Distribution			Percentage Point Change	
Scores	1975	1979	1985	1975-79	1979-85
100-125	3.0%	2.3%	3.0%	-0.7	+ 0.7
126-150	7.5	7.3	17.6	-0.2	+10.3
151-175	11.3	11.3	15.6	0.0	+ 4.3
176-300	50.0	44.7	45.4	-5.3	+ 0.7
>300	28.2	34.5	18.5	+6.3	-16.0
Total	100.0	100.0	100.0		
Number*	7,153	11,087	15,225		
Mean	252	264	226		
St. Dev.	86.2	93.8	83.2		
C.V.	34.2%	35.5%	36.8%		

*Approved applications by FY of IRG review.

The standard deviation of scores shows a decline in variability from 93.8 in 1979 to 83.2 in 1985. However, since scores are edging toward their limit of 100, the coefficient of variation which has shown little change, provides a more meaningful measure of relative change in the variability or dispersion of scores.

Priority Scores of Competing R01 Applications* at Indicated Percentiles and Paylines, FY1975–1985 (selected years)



*Summarized by fiscal year of IRG review; includes amendments.
**Score at 90th percentile of funded applications.
Source: NIH, DRG, Statistics and Analysis Branch

8706-W28

BEST COPY AVAILABLE

The median score (50th percentile) is sometimes used instead of the mean as an indicator of priority score trends. Scores at the 30th, 50th and 90th percentiles (shown) generally confirm the trends found in mean R01 scores--a slight increase from 1975-1979 followed by declining scores from 1979 to the present. In new applications, median scores dropped from 268 in 1979 to 231 in 1985--a decline of 37 points which is the same as the mean. Median scores on competing renewals declined from 175 in 1979 to 147 in 1985--down 44 points compared to a 39 point drop in mean scores.

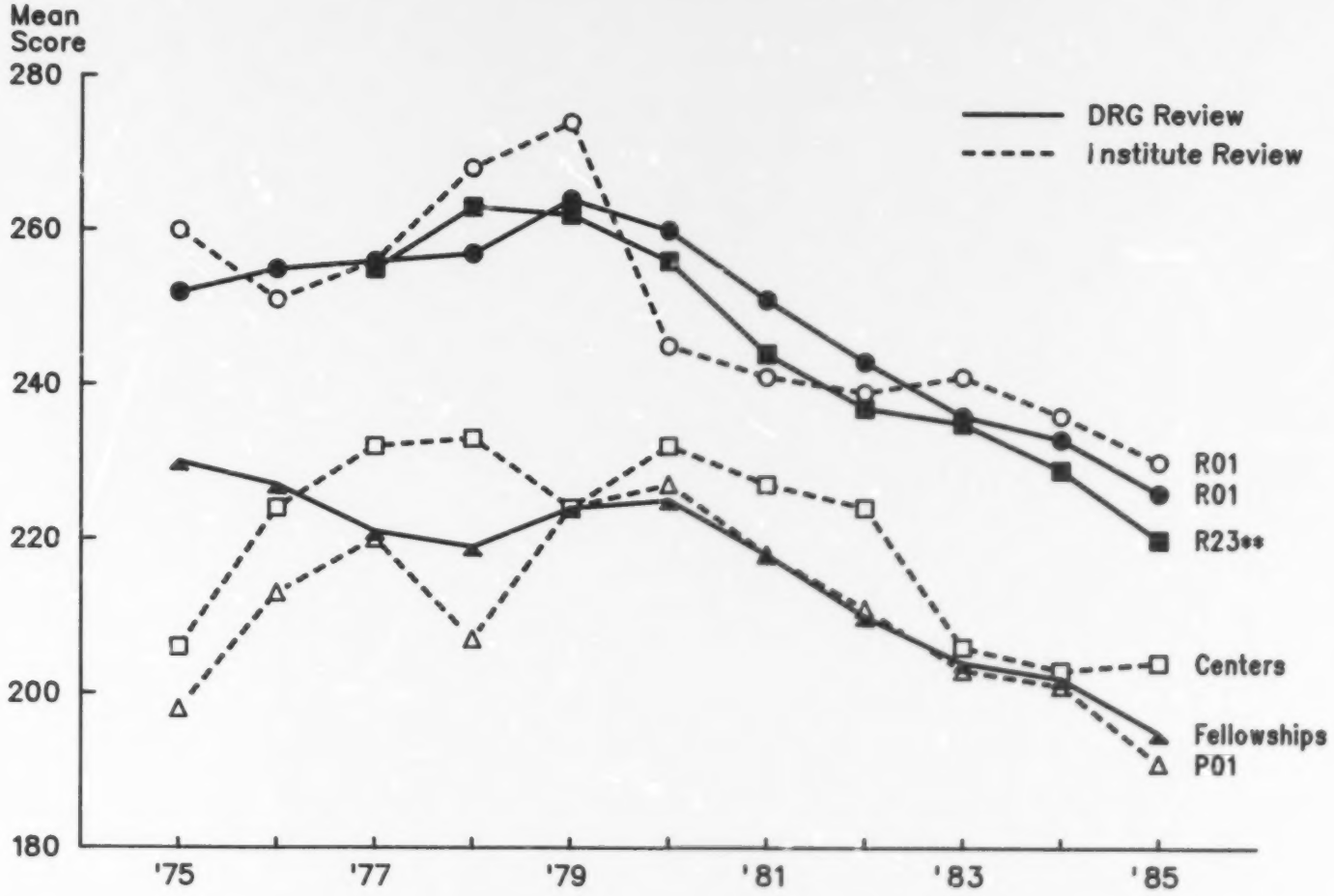
The score at the 90th percentile of applications which have been funded is referred to as the payline (see technical note). Like other score trends, since 1979 the payline has declined for both new and competing renewal R01 applications. New R01 applications showed a payline score of 240 in 1979 compared to only 173 in 1985. Similarly, the payline score for competing renewals declined from 233 in 1979 to 169 in 1985. After a sharp drop from 1979 to 1981 the payline for new applications has closely followed the trend of the 30th percentile score while on competing renewals with their better scores, the payline followed the 50th percentile.

	New Applications				Competing Renewals			
	Payline Score*	Percentile 30th	50th	Mean Score	Payline Score*	Percentile 30th	50th	Mean Score
1975	256	203	250	264	244	175	210	225
1977	229	204	258	270	221	175	211	228
1979	240	208	268	278	233	175	210	232
1981	201	200	257	266	199	171	200	221
1983	183	185	241	249	183	160	189	208
1985	173	178	231	241	169	147	166	193
1975-79	-16	+5	+18	+14	-11	0	0	+7
1979-85	-67	-30	-37	-37	-64	-28	-44	-39

*Score at 90th percentile of funded applications
Summarized by fiscal year of IRG review.

The percentile rank of each application within its reviewing study section has become an increasingly important statistic used by institutes in assessing their relative merit. Because priority score distributions vary considerably from one study section to another, many institutes routinely consider the percentile rank of an application in making funding decisions.

Mean Priority Scores of Competing Applications for Selected Grant Activities, FY1975–1985*



*Summarized by fiscal year of IRG review; excludes withdrawals and deferrals.
**R23 data begins in 1977.
Source: NIH, DRG, Statistics and Analysis Branch

8706–W15

BEST COPY AVAILABLE

The decline in mean priority scores since 1979 is not unique to R01 applications reviewed by DRG study sections. A comparable trend is found in New Investigator Research Awards (R-23) and Fellowships, as well as in applications reviewed by Institute Review groups such as Research Centers, Research Program Projects (P01's), and R01's. Score declines from 1979 to 1985 ranged from 20 points for centers to 44 on R01's reviewed by Institutes. Less variability is seen in the scores of centers and P01 applications.

	DRG Review			Institute Review		
	R01	R23	Fellows	R01	P01	Centers
1975	252	-	230	260	198	206
1977	256	255	221	256	220	232
1979	264	262	224	274	224	224
1981	251	244	218	241	218	227
1983	236	235	204	241	203	206
1984	233	229	202	236	201	203
1985	226	220	195	230	191	204
1979-85	-38	-42	-29	-44	-33	-20
1985 C.V.	36.8	38.5	34.4	35.8	31.9	29.1
St. Dev.	83.2	84.9	67.2	82.5	60.7	59.3

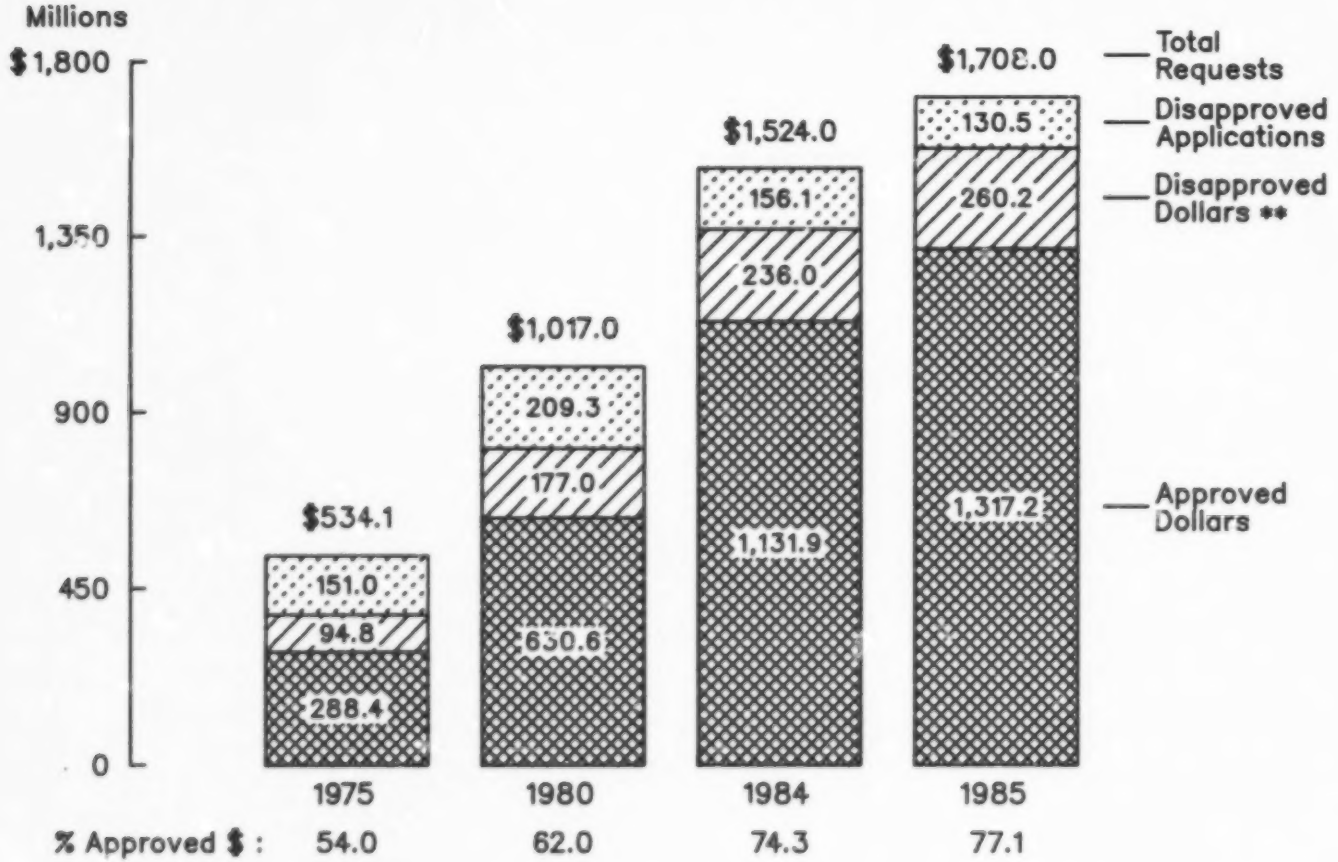
Summarized by fiscal year of IRG review.

The striking difference in score level is reduced if centers and program projects (P01's) are compared to longer term R01's (requests for 5 or more years) which receive substantially better scores (page 46); especially if comparisons are limited to competing renewals.

Most activities show a steady increase in recommended approval rates over the ten year period, although approval of R01's reviewed by Institutes still remains under 80 percent.

	R01	R23	Fellows	R01	P01	Centers
1975	72.1	*	83.1	53.9	69.8	98.3
1977	75.6	72.2	84.1	43.7	77.9	67.6
1979	77.6	80.2	87.6	61.2	77.0	81.7
1981	82.9	83.0	86.4	56.9	89.2	94.1
1983	88.5	88.3	90.7	70.5	87.3	80.4
1984	89.6	91.0	91.0	73.6	91.0	88.4
1985	92.3	92.6	93.2	77.9	89.5	91.3
1975-85	+20.2	*	+10.1	+24.0	+19.7	-7.0

Requested vs. IRG Approved Dollar Support on Competing R01 Applications* Reviewed by DRG Study Sections, FY 1975–1985 (selected years)



*First year of requested support summarized by fiscal year of IRG review. Excludes withdrawals and supplements. ** Dollar reduction in approved applications.
Source: NIH, DRG, Statistics and Analysis Branch

8706–W34

BEST COPY AVAILABLE

The amount of first year support requested on R01 applications reviewed by DRG study sections more than tripled from $534 million in 1975 to $1.7 billion in 1985. If requests are converted to constant dollars (1975=100) using the Biomedical Research and Development Price Index, then 1985 requested support is reduced to $868 million or an increase of 60 percent over 1975.

Recommendation for approval of R01 applications increased from 72.2 percent in 1975 to 92.3 in 1985. However, recommendation of first year dollar support was considerably lower--54.0 percent in 1975 increasing to 77.1 percent in 1985. This is the result of recommended dollar reduction in approved applications.

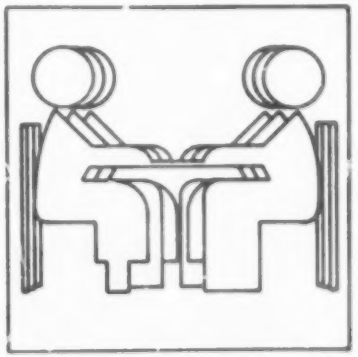
	Amount Requested*			No. of Applications		
	1975	1980	1985	1975	1980	1985
Approved	54.0	62.0	77.1	72.2	79.6	92.3
Total Disapproved	46.0	38.0	22.8	27.8	20.4	7.7
Disapprovals	28.3	20.6	7.6	27.8	20.4	7.7
$ Reduction	17.7	17.4	15.2	-	-	-
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number	$534.1	1,017.0	1,708.0	9,924	13,602	16,478

*First year request in millions of dollars.
Summarized by fiscal year of IRG review.

Recommended dollar reduction was somewhat greater on competing renewals than on new applications; however, this was more than offset by their extremely high rate of application approval.

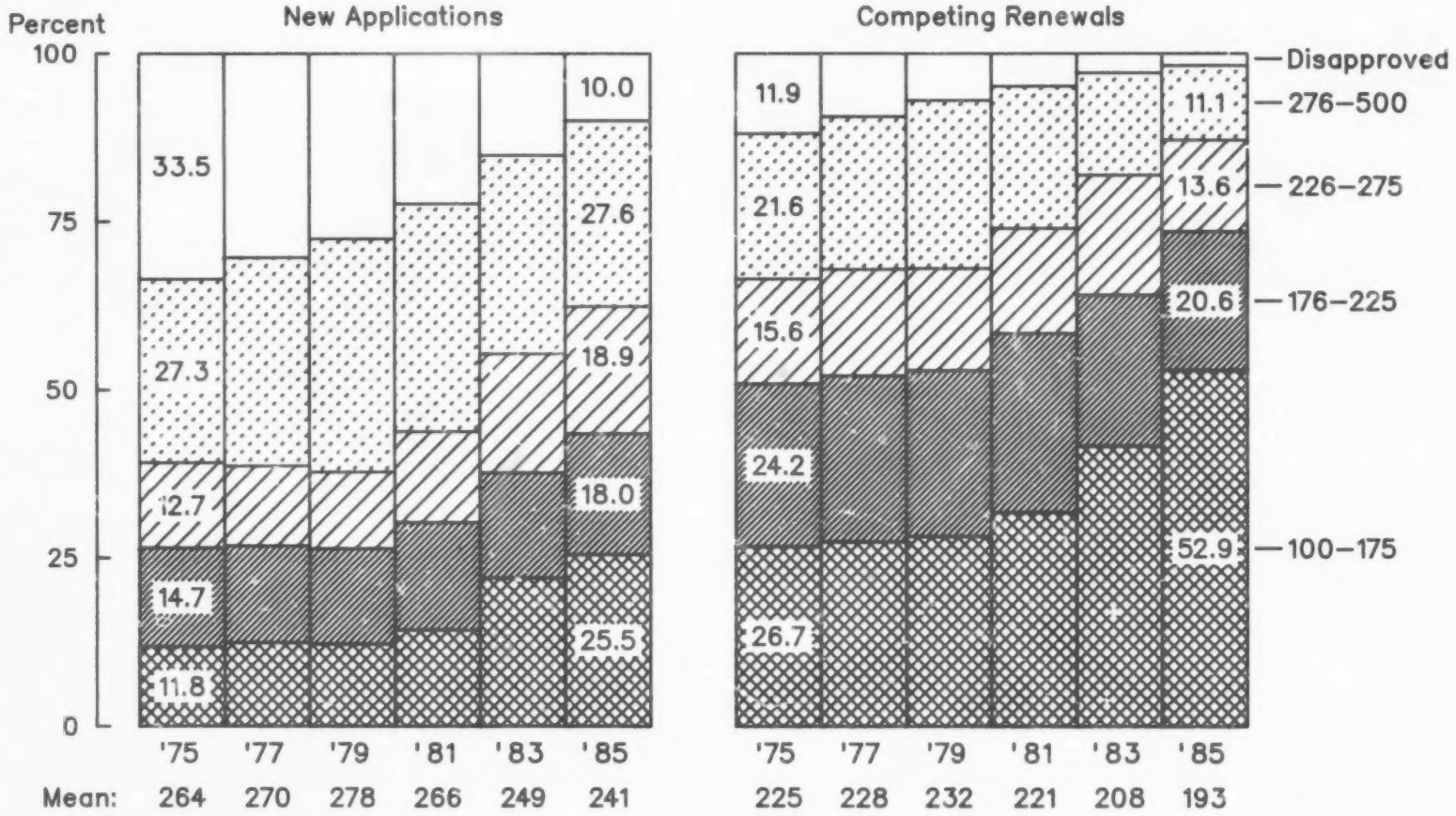
	New Applications			Competing Renewals		
	1975	1980	1985	1975	1980	1985
Approved	48.4	57.8	75.5	68.1	73.2	82.4
Total Disapproved	51.6	42.2	24.5	31.9	26.8	17.6
Disapprovals	35.6	26.7	10.6	11.2	6.0	1.6
$ Reduction	16.0	15.5	13.9	20.7	20.8	16.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
Amount*	$373.0	715.4	1,141.1	$161.2	301.6	567.3

BLANK PAGE



3. APPLICATION CHARACTERISTICS (R01) RELATED TO STUDY SECTION ACTION
   - Type application: new, renewal
     - Study section actions: disapprovals, score distribution
     - Frequency distributions of priority scores
     - Trends in recommended approval rates
     - Trends in mean priority scores
     - Applications in fundable range
   - Requested years of support
     - Distribution of applications
     - Requested vs. approved years of support
     - Trends in mean priority scores
     - Study section actions: disapprovals, score distribution
     - Frequency distributions of priority scores
   - Institute assignment
     - Number of applications
     - Study section actions: disapprovals, score distribution
     - Difference in mean priority scores

DRG Study Section Action on Competing R01 Applications*
By Type Application, FY 1975–1985 (selected years)



*Original and amended applications summarized by fiscal year of IRG review; excludes withdrawals and supplements.
Source: NIH, DRG, Statistics and Analysis Branch

8706-W35

An annual decline in the proportion of applications disapproved by DRG study sections occurred in both new and competing renewal applications. This trend escalated in new applications with the proportion of disapprovals down by 15 percentage points from 1980-1985 -- almost double the 8.5 point decline from 1975-1980. For competing renewals, who are less likely to be disapproved, the trend remained relatively consistent throughout the ten year period--a 5.3 point decline from 1975-1980 followed by a 4.8 point decline from 1980-1985. In 1985, only 1.8 percent of applications for renewal were disapproved compared to 10.0 percent of new applications. If mean scores include these disapprovals (as if they had a priority score of 501), then the jump in mean scores from 1970-1980 is eliminated.

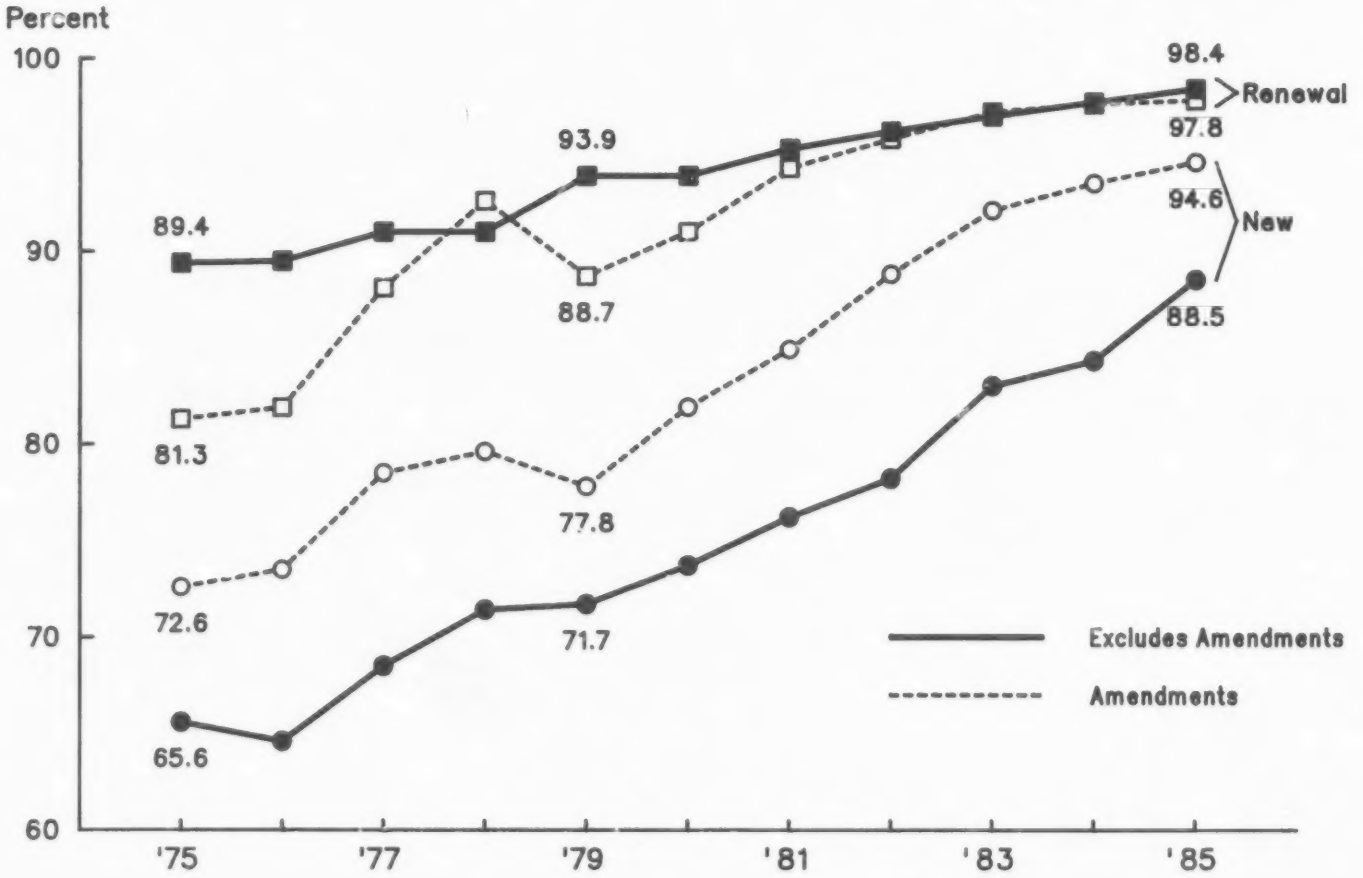
The proportion of R01 applications with scores 100-175 greatly increased since 1980. Renewals showed an especially large increase in the proportion with these scores -- a 22.2 percentage point increase compared to an increase of 13.0 points on new applications. It is interesting that from 1975 to 1985, the proportion (scored 100-175) just about doubled in both new and renewal applications; new applications doubled from 11.8 to 25.5 percent -- competing renewals from 26.7 to 52.9 percent. The large increase in renewals with these excellent scores merely reflects their nature -- that they have already weeded out the poorest applications and will have a higher proportion of good scores.

Recent 1986 data shown below indicate a continuation of these trends.

	Number Reviewed		Percent Disapproved		Percent 100-175*		Reviewed Mean score**	
	New	Renewal	New	Renewal	New	Renewal	New	Renewal
1975	7330	2585	33.5	11.9	11.8	26.7	344	258
1976	8460	2881	34.3	11.5	10.9	28.8	349	254
1977	9235	3643	30.3	9.4	12.4	27.4	340	253
1978	9516	3691	27.4	8.7	13.7	28.5	333	255
1979	10739	3549	27.5	7.0	12.2	28.2	339	251
1980	10178	3431	25.0	6.6	12.5	30.7	331	244
1981	10484	4533	22.3	4.9	14.3	31.8	319	235
1982	10750	4841	19.8	3.9	17.2	36.8	305	227
1983	10549	4382	15.1	2.9	22.0	41.6	287	216
1984	11125	4498	13.7	2.3	22.9	48.1	282	208
1985	11734	4753	10.0	1.8	25.5	52.9	267	198
1986	10020	5266	7.9	0.9	28.4	55.5	256	190
1975-80	+2848	+846	- 8.5	- 5.3	+ 0.7	+ 4.0	-13	-14
1980-85	+1556	+1322	-15.0	- 4.8	+13.0	+22.2	-64	-46

*Percent of reviewed applications by FY of IRG review.
**Mean includes disapprovals as if they had a priority score of 501.

Approval Rate of Competing New and Renewal R01 Applications Reviewed by DRG Study Sections, FY 1975–1985*



*Summarized by fiscal year of IRG review; excludes withdrawals and supplements.
Source: NIH, DRG, Statistics and Analysis Branch

8706–W5

The proportion of competing R01 applications that are disapproved has drastically declined in the past decade. This is true of both new and competing renewals, both amendments and non-amendments. If amendments are excluded, 11.5 percent of new applications were disapproved in 1985 -- down from 34.4 percent in 1975; only 1.6 percent of 1985 competing renewals were disapproved compared to 10.6 percent a decade ago. Amendments to previously reviewed applications show similar downward trends. Recent 1986 data indicate a continuation of these trends.

The percent of reviewed applications with a score of 401-500 increased from 1975 to 1979, leading to speculation that at least part of the decline in disapprovals merely reflected a tendency to approve applications but give them poor scores. However, since 1979, the proportion with scores over 400 has also declined each year suggesting either an overall improvement in applications or an easing of review standards.

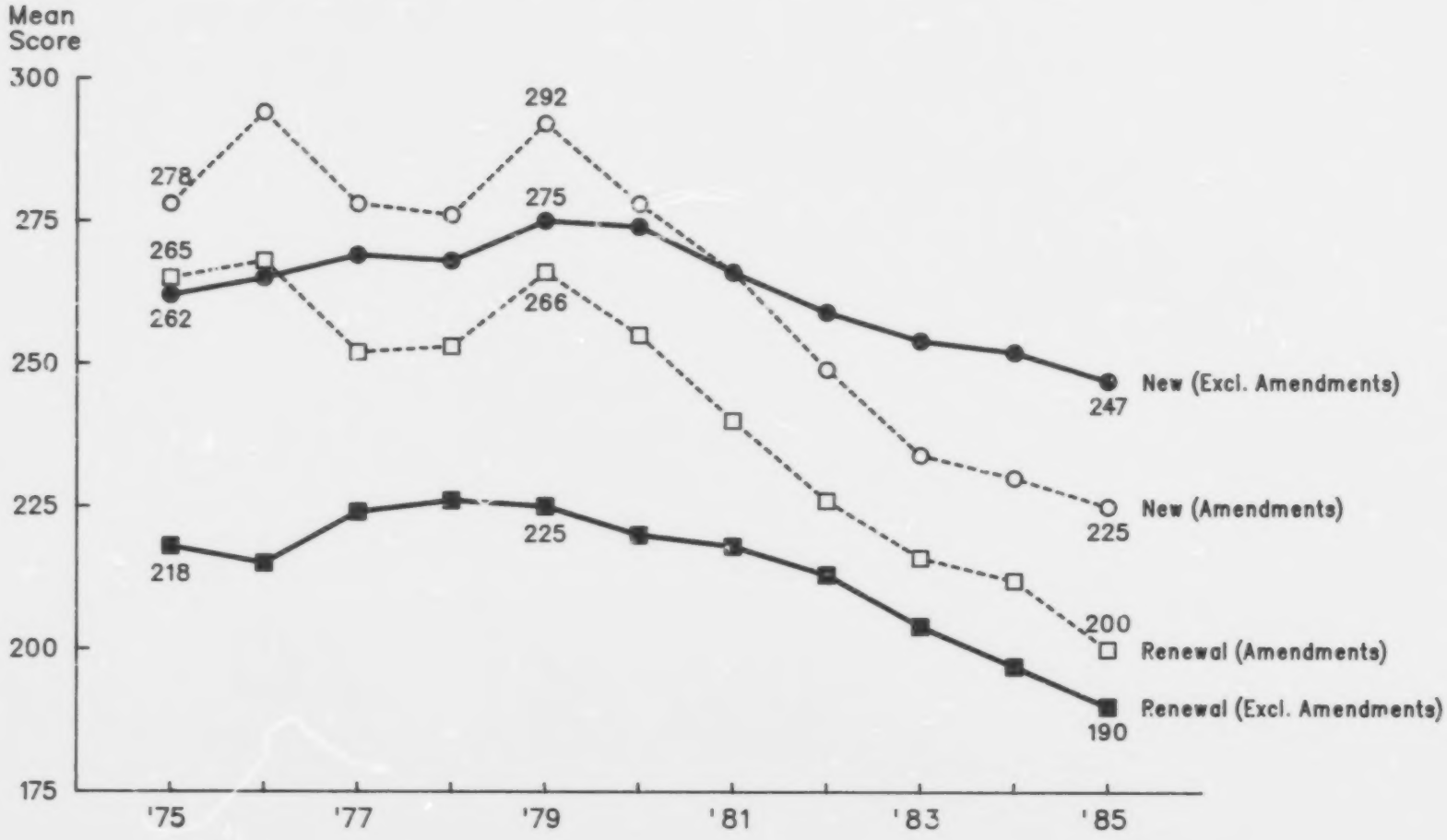
The number of reviewed R01 applications and the percent that was either disapproved or scored 401-500 is as follows:

	New Applications (excl. amendments)			Competing Renewals (excl. amendments)		
	Number Reviewed	Dis-approved	401-500	Number Reviewed	Dis-approved	401-500
1975	6,406	34.4	5.2	2,179	10.6	2.1
1977	8,071	31.5	7.0	3,113	9.0	3.1
1979	9,311	28.3	8.7	2,927	6.1	3.9
1981	8,780	23.8	7.0	3,785	4.7	2.7
1982	8,747	21.8	6.0	3,661	3.8	2.3
1983	8,401	17.0	5.9	3,146	3.0	2.0
1984	8,675	15.7	5.8	3,360	2.3	1.6
1985	8,960	11.5	5.9	3,494	1.6	1.4
1986	7,424	9.5	5.6	3,907	1.0	1.0
1975-79	+2,905	- 6.1	+3.5	+748	-4.5	+1.8
1979-85	-351	-16.8	-2.8	+567	-4.5	-2.5

Percent based on reviewed applications by FY of IRG review.

BLANK PAGE

Mean Priority Scores of Competing New and Renewal R01 Applications Approved by DRG Study Sections, FY 1975--1985*



*Summarized by fiscal year of IRG review; excludes withdrawals and supplements.
Source: NIH, DRG, Statistics and Analysis Branch

8706-W3

From 1979 to 1985, mean scores of amendments declined at a sharper rate than non-amendments -- about 66 points for both new and competing renewals. In part, this was due to the amendment of applications with excellent scores that, in earlier years, would have received funding. Since 1981, amendments to new applications averaged better (lower) scores than non-amendments. The decline in new (type 1) mean scores is influenced by these amendments -- a 28 point score decline since 1979 jumps to 37 points when amendments are included.

Amendments to competing renewals continue to average poorer scores than non-amendments, however this gap is narrowing. Since 1979, mean scores of competing renewals declined by 35 points vs. 39 points if amendments are included.

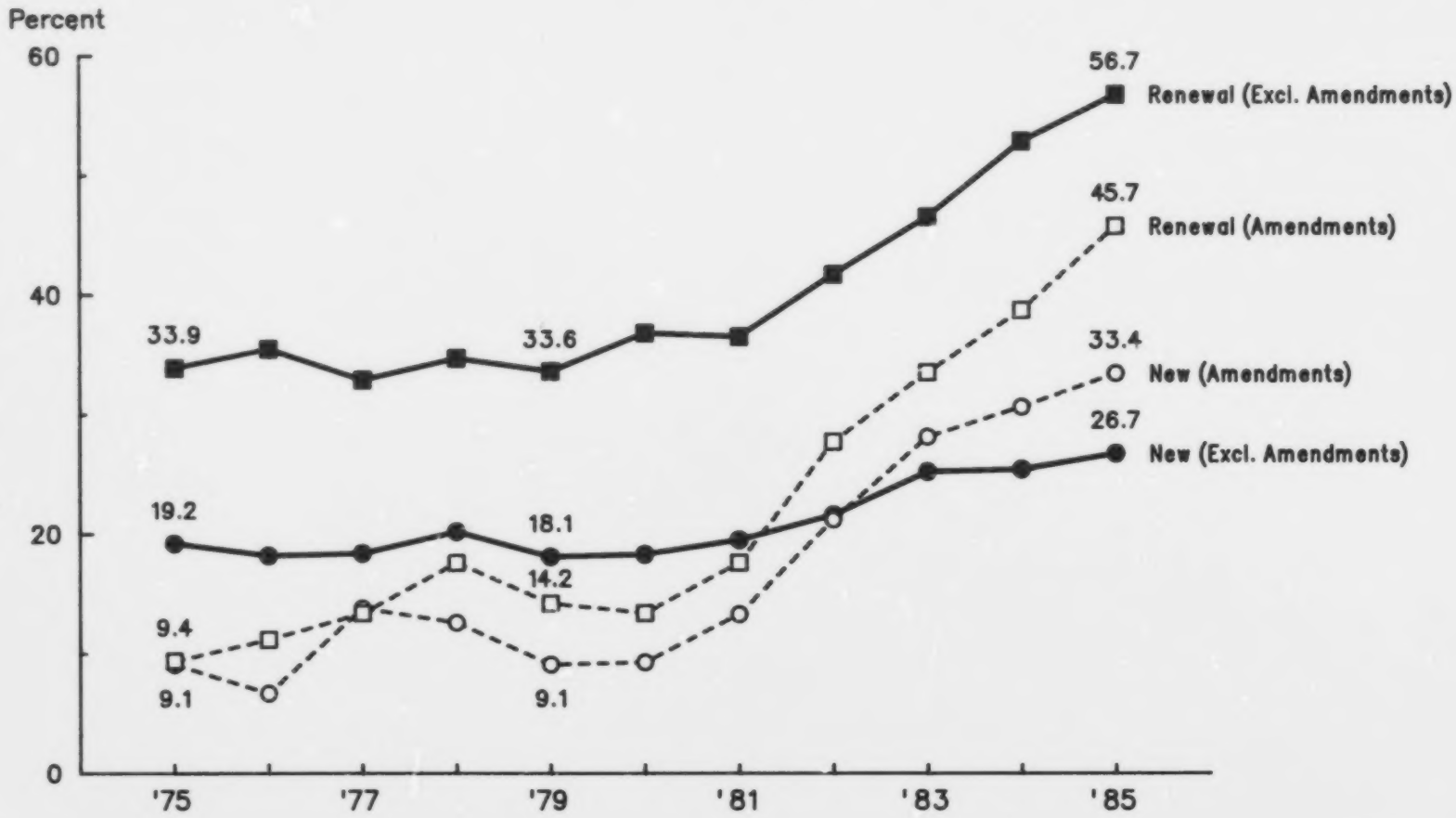
	New Applications			Competing Renewals		
	Excl. Amend.	Incl. Amend.	Diff.	Excl. Amend.	Incl. Amend.	Diff.
1975	262	264	+2	218	225	+7
1977	269	270	+1	224	228	+4
1979	275	278	+3	225	232	+7
1981	266	266	0	218	221	+3
1983	254	249	-5	204	208	+4
1984	252	247	-5	197	201	+4
1985	247	241	-6	190	193	+3
1986	243	235	-8	185	188	+3
1975-79	+13	+14		+17	+ 7	
1979-85	-28	-37		-35	-39	

The change since 1979 in either the quality of R01 applications or review standards is even more obvious if disapproved applications are included (as if they had a priority score of 501). Mean scores of new applications would then drop by 72 points and competing renewals by 53 points.

	New Applications*			Competing Renewals*		
1975	344	344	-	248	258	+10
1979	339	339	-	242	251	+9
1985	276	267	-9	195	198	+3
1975-79	-5	-5		-6	-7	
1979-85	-63	-72		-47	-53	

*Reviewed mean scores including disapprovals with an assumed priority score of 501.

Competing R01 Applications Approved by DRG Study Sections: Percent with Scores Less Than 176, FY 1975–1985*



*Summarized by fiscal year of IRG review; excludes withdrawals and supplements.
Source: NIH, DRG, Statistics and Analysis Branch

8706-W6

Since 1979, the proportion of approved R01 applications with excellent priority scores (100-175) has increased annually. This follows an essentially stable period from 1975-1979. Competing renewals show significantly more improvement than new applications -- an increase of 23.5 vs. 11.4 percentage points since 1979.

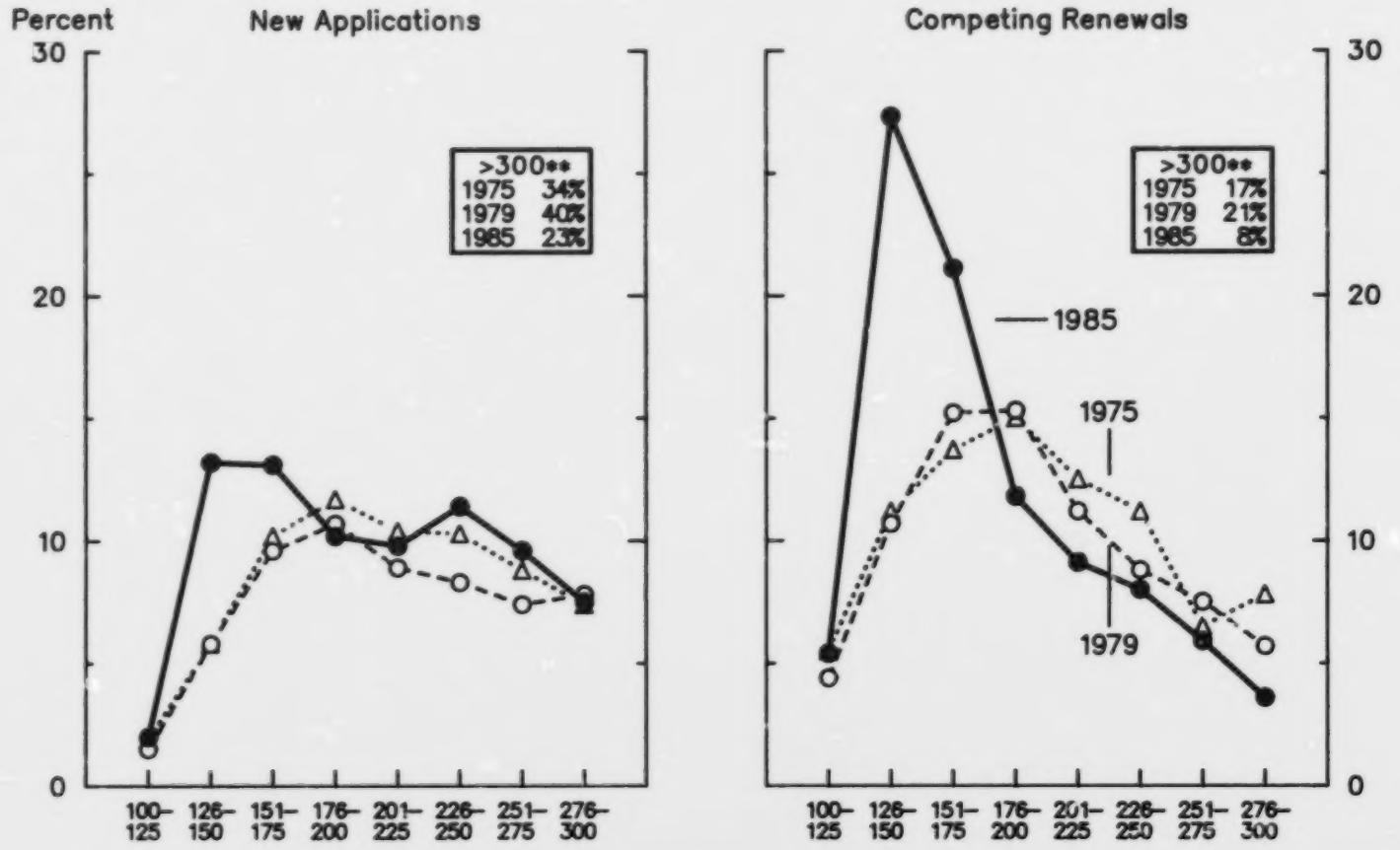
Although amendments to applications contribute to this trend, they are not responsible for it. If amendments are excluded, the percent with scores 100-175 increased by 8.6 points for new applications and 23.1 points for renewals. In recent years, many applications with scores that were previously fundable have remained unfunded. This is an important factor contributing to the substantial increase in amendments with scores in the 100-175 range. Improvement in these scores also coincides with policy changes which provide for more feedback to applicants following initial review.

Percent of approved R01 applications with scores 100-175:

	New Applications			Competing Renewals		
	Excl. Amend.	Incl. Amend.	Diff.	Excl. Amend.	Incl. Amend.	Diff.
1975	19.2	17.8	-1.4	33.9	30.9	-3.6
1977	18.4	17.8	-0.6	32.9	30.2	-2.7
1979	18.1	16.9	-1.2	33.6	30.3	-3.3
1981	19.5	18.4	-1.1	36.5	33.4	-3.1
1983	25.3	25.9	+0.6	46.5	42.8	-3.7
1984	25.3	26.6	+1.3	52.8	49.2	-3.6
1985	26.7	28.3	+1.6	56.7	53.8	-2.9
1986	28.0	30.9	+2.9	57.9	56.0	-1.9
1975-79	-1.0	-0.9		-0.3	-	
1979-85	+8.6	+11.4		+23.1	+23.5	

Summarized by FY of IRG review.

Priority Score Distributions of Competing R01 Applications Approved by DRG Study Sections, FY 1975, 1979, 1985*



*Summarized by fiscal year of IRG review; excludes withdrawals and supplements.
**Distribution of scores over 300 not shown.
Source: NIH, DRG, Statistics and Analysis Branch

8706-W4

The shift toward scores in the 126-175 range since 1979 is underscored in these frequency distributions. The proportion of new applications with scores 126-150 more than doubled from 5.8 percent in 1979 to 13.2 in 1985 (an increase of 7.4 points). Applications with scores 151-175 increased by about one-third from 9.6 to 13.1 (up 3.5 percentage points). Renewal applications with scores ranging from 126-150 also more than doubled from 10.7 to 27.3 percent (an increase of 16.6 points) while scores 151-175 increased by just over one-third or from 15.2 to 21.1 percent (5.9 points). Although competing renewals showed substantially larger changes than new applications, both increased by similar proportions. In addition, as paylines tightened, competing renewals had to become extremely competitive or risk losing their funding.

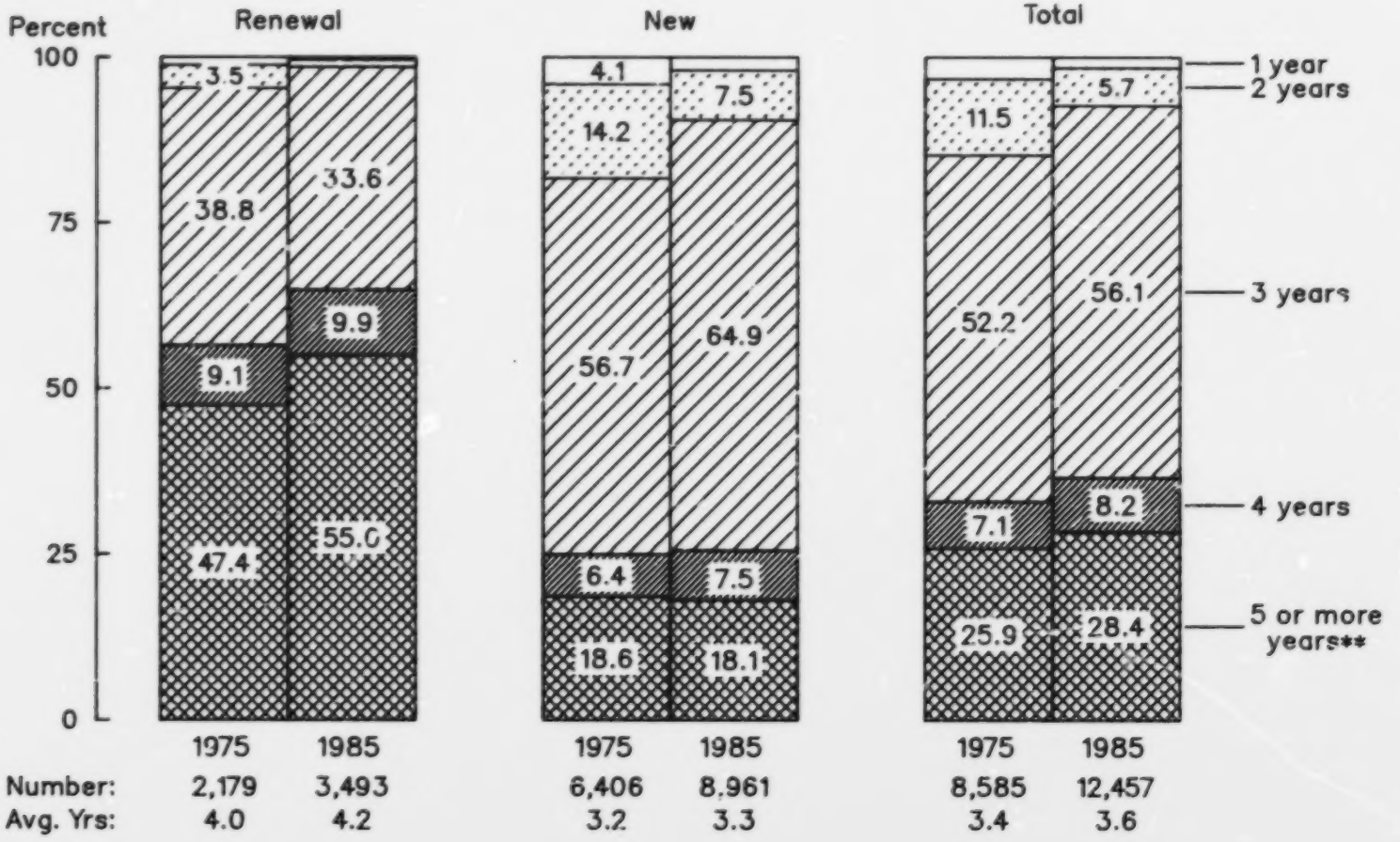
From 1975 to 1979 there were no dramatic changes in the proportion of applications with low scores. Instead, change consisted in a very gradual shift toward applications with scores over 300. These higher scores (over 300) increased from 34 to 40 percent of new applications and 17 to 21 percent of renewals.

	New Applications			Competing Renewals		
Scores	1975	1979	1985	1975	1979	1985
100-125	1.9	1.5	2.0	5.5	4.4	5.4
126-150	5.8	5.8	13.2	11.2	10.7	27.3
151-175	10.2	9.6	13.1	13.7	15.2	21.1
176-300	48.6	43.1	48.5	53.0	48.5	38.4
>300	33.6	40.1	23.2	16.7	21.1	7.8
Total	100.0	100.0	100.0	100.0	100.0	100.0
No.*	4876	7788	10556	2277	3299	4669
Mean	264	278	241	225	232	193
St. dev.	87.8	94.7	85.6	76.0	83.4	66.1
C.V.	33.3	34.1	35.5	33.8	35.9	34.2

*Approved applications by FY of IRG review.

The dispersion of scores about the mean as measured by the standard deviation decreased considerably since 1979; however, there is little change if score variability is expressed as a percent of the mean (coefficient of variation or C.V.).

Distribution of Reviewed R01 Applications* by Requested Years of Support, FY1975, FY1985



*Excludes amendments, withdrawals and supplements. Summarized by fiscal year of IRG review.
**Includes less than 2% requesting 6 or more years.
Source: NIH, DRG, Statistics and Analysis Branch

8611-W16

BEST COPY AVAILABLE

Since 1975, the primary change in the number of years requested by R01 applicants has been a decline in requests for either 1 or 2 years of support. This group dropped from 18 to 10 percent of new applications and from 5 to 2 percent of renewals. Each resulted in a shift toward the most commonly requested number -- 3 years of support for new applications and 5 years for renewals.

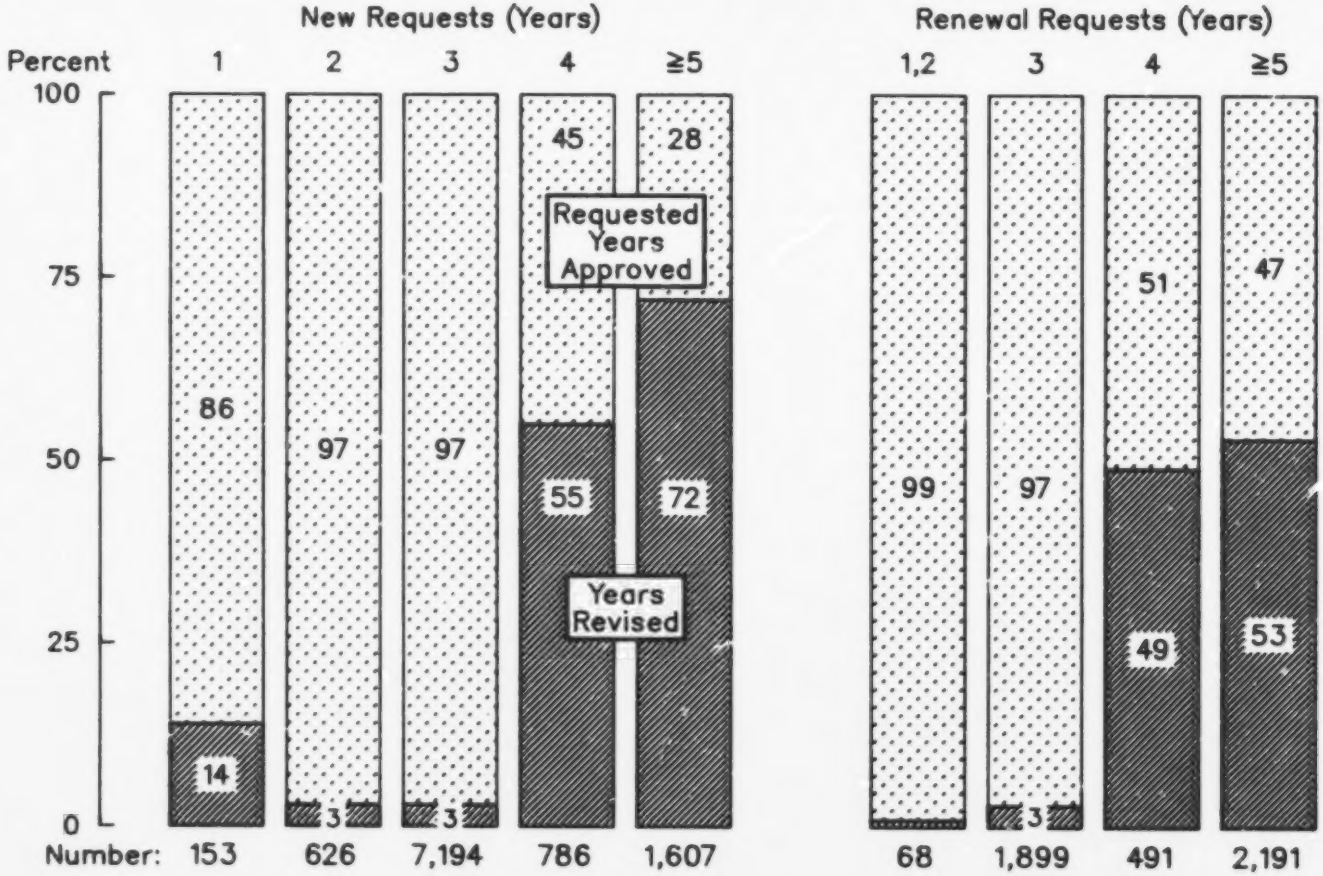
The years requested on new applications differ noticeably from competing renewals. In 1985, two-thirds of the new applications requested 3 years of NIH support, followed by 18 percent requesting 5 or more years, 10 percent requesting 1 or 2 years and 8 percent requesting 4 years. Renewal applications showed a completely different pattern. More than half of 1985 competing renewals requested 5 or more years of support, followed by 34 percent requesting 3 years and 10 percent requesting 4. Very few renewals -- only 2 percent -- requested 1 or 2 additional years. Because new applications outnumber renewals by a more than 2 to 1 margin, the total R01 distribution more closely resembles new applications. Nearly 60 percent of all 1985 applications requested 3 years followed by 28 percent requesting 5 or more. Ordinarily, the period of requested support is 5 years or less with under 1 percent of the applicants requesting more than 5 years.

Applications requesting 5 or more years of support include a much smaller proportion of amended applications than others. The graphed data excludes amendments in order to present a clear picture of requests for support.

	Number Reviewed		Non-amendments*		Amendments (%)	
	1975	1985	1975	1985	1975	1985
New Applications						
1 & 2	1293	1049	1173	852	9.3	18.8
3	4230	7883	3635	5815	14.1	26.2
4	467	888	409	674	12.4	24.1
>4	1340	1911	1189	1620	11.3	15.2
Competing Renwals						
1 & 2	122	75	103	52	15.6	30.7
3	1045	1923	845	1172	19.1	39.0
4	244	471	199	348	18.4	26.1
>4	1174	2282	1032	1921	12.1	15 8

* By FY of IRG review.

Percent Distribution of Approved R01 Applications:* Study Section Action on Requested Years of Support, FY1985



*Excludes withdrawals and supplements. Includes original and amended applications summarized by fiscal year of funds or requested start date.
Source: NIH, DRG, Statistics and Analysis Branch

8706-W12

Recommendation for approval or revision of the years of support requested by R01 applicants is among the responsibilities of DRG study sections. In both new and competing renewal applications, recommended revisions consisted mainly in reduction of years of support on applications requesting 4 or more years. However, during the period 1975-1985, a small group (7-14 percent) of new applications requesting only 1 year were increased to 2 or 3 years.

In 1985, 55 percent of new applications requesting 4 years of support and 72 percent of requests for 5 or more years were reduced. Similarly, years of support were reduced on 49 percent of renewals requesting 4 years and 53 percent requesting 5 or more years. Recommended revisions were especially noticeable on renewal applications since more than half requested 4 or more years of additional support. On new applications, revisions had minimal effect since only about one-fourth requested 4 or more years of support. The proportion of applications with changes (or reductions) in requested years of support has generally declined over the 10 year period. Applications with years approved as requested have better priority scores than those whose years have been reduced.

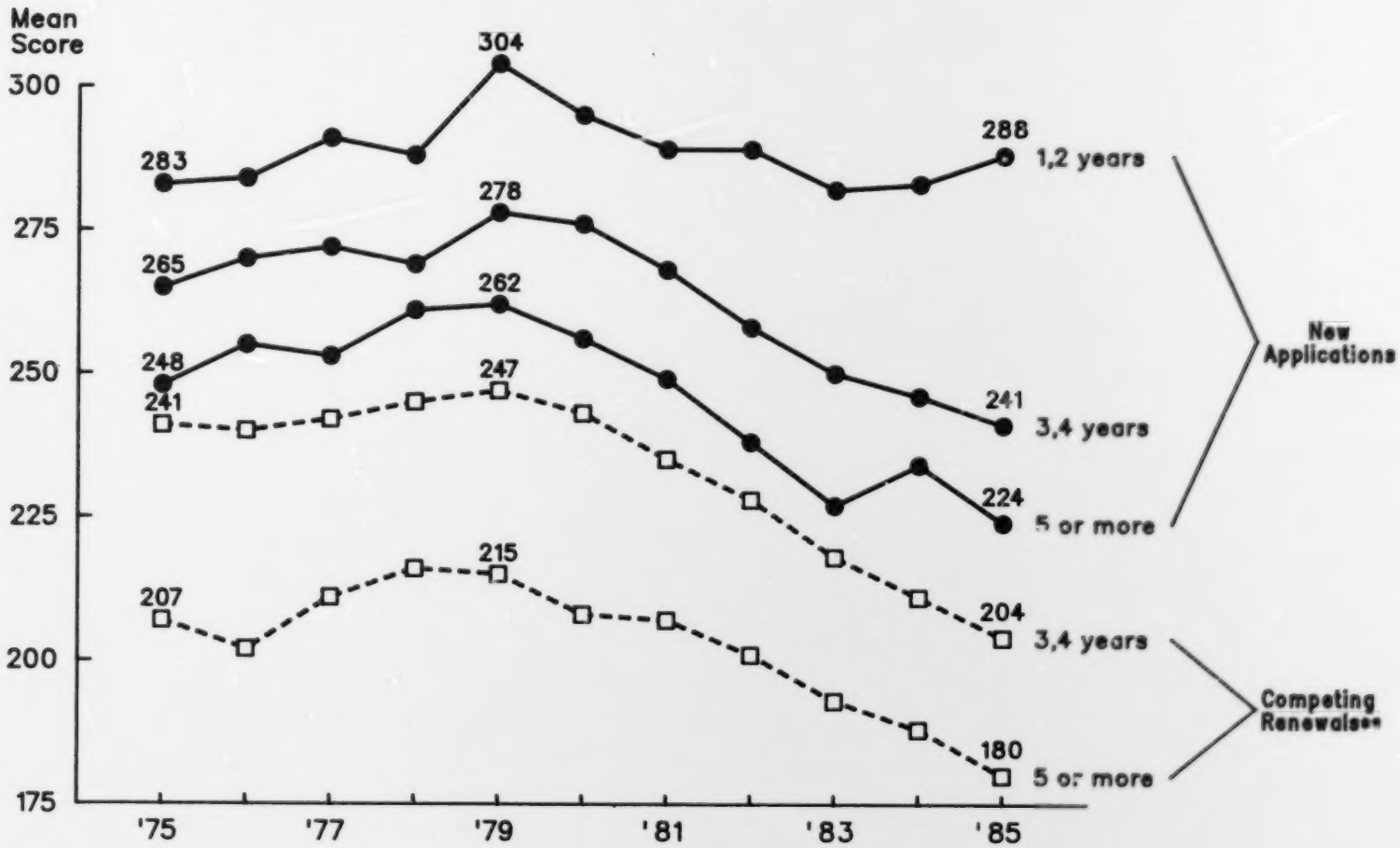
Years Requested	Percent of Applications with Revised Years of Support		
	1975	1980	1985
New Applications			
1	7%	7%	14%
2	4	3	3
3	9	6	3
4	71	59	55
5 or more	82	76	72
Competing Renewals			
1,2	8	2	1
3	8	5	3
4	51	50	49
5 or more	57	51	53

Summarized by requested start date or FY of funds.

Over the 10 year period, the average years of support approved by DRG study sections has increased only slightly from 2.9 to 3.0 years for new R01 applicants and from 3.4 to 3.5 years for competing renewals.

	New	Renewal	Total
1975	2.9	3.4	3.0
1979	2.9	3.3	3.1
1983	3.0	3.3	3.1
1985	3.0	3.5	3.2

Mean Priority Scores of DRG Approved R01 Applications by Requested Years of Support, FY1975–1985*



*Includes original and amended applications summarized by fiscal year of IRG review; excludes withdrawals and supplements. **Renewals requesting one or two years of support omitted due to small number.
Source: NIH, DRG, Statistics and Analysis Branch

8708–W7

Applicants requesting 5 or more years of support receive substantially better scores than those requesting fewer years. Poorest average scores are found on applications requesting support for only 1 or 2 years. The large number of applications seeking 3 years of support fall between these two extremes. This relationship between scores and requested years of support is noted in all years and in both new and competing renewal applications. The causes and explanation of this are issues that are being examined. In addition to receiving poorer scores, requests for 1 or 2 years of support show a smaller decline in mean scores from 1979-1985.

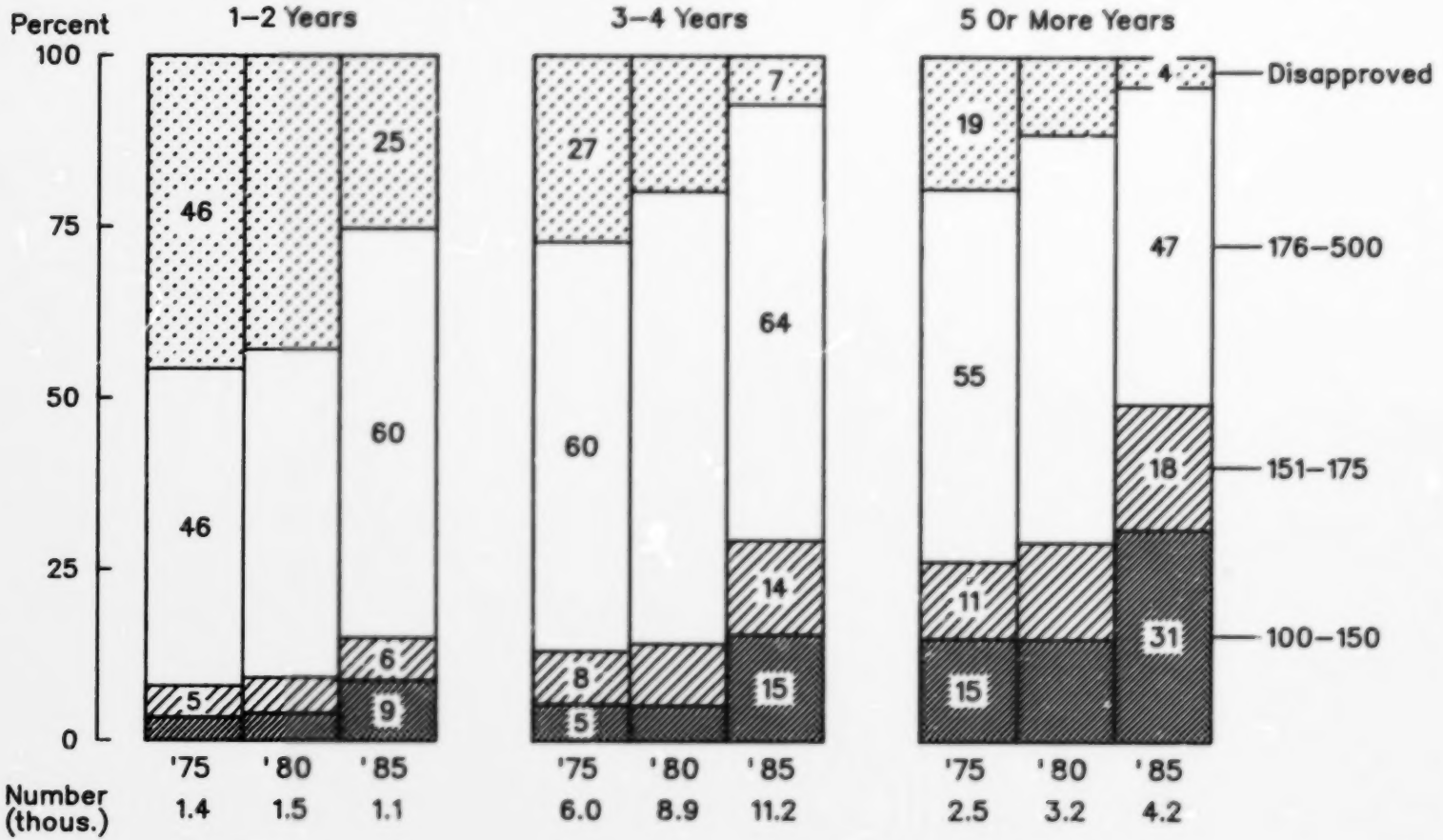
Together with council recommendation and institute program priorities, priority scores form an important consideration in the success of applications. Better scores result in a much higher probability of funding for longer term projects. In 1985, success rates for both new and renewal applications seeking 5 or more years of support were more than double those seeking funding for 1 or 2 years. Success rates ranged from 14 percent to a high of 30 percent on new applications and from 26 to 59 percent on competing renewals.

Mean scores and success rates by requested years of support:

	Mean Scores*				Success Rates**			
	1&2	3	4	>4	1&2	3	4	>4
New Applications								
1975	283	266	263	248	27	36	38	42
1977	291	272	266	253	14	21	22	28
1979	304	278	273	262	18	33	37	39
1981	289	269	262	249	13	22	27	30
1983	282	251	242	227	13	23	26	32
1985	288	240	241	224	14	22	23	30
1979-85	-16	-38	-32	-38				
Competing Renewals								
1975	238	244	230	207	53	54	56	66
1977	253	245	229	211	29	33	43	53
1979	243	242	236	215	49	52	61	62
1981	234	237	225	207	33	40	48	59
1983	228	220	209	193	46	37	45	56
1985	224	206	194	180	26	41	49	59
1979-85	-19	-43	-42	-35				

*By FY of IRG review.
**Original & amended applications by FY of funds or requested start date.

DRG Study Section Rating of Competing R01 Applications* by Requested Years of Support, FY1975, 1980, 1985



*Excludes withdrawals and supplements. Includes original and amended applications summarized by fiscal year of IRG review.
Source: NIH, DRG, Statistics and Analysis Branch

8706-W13

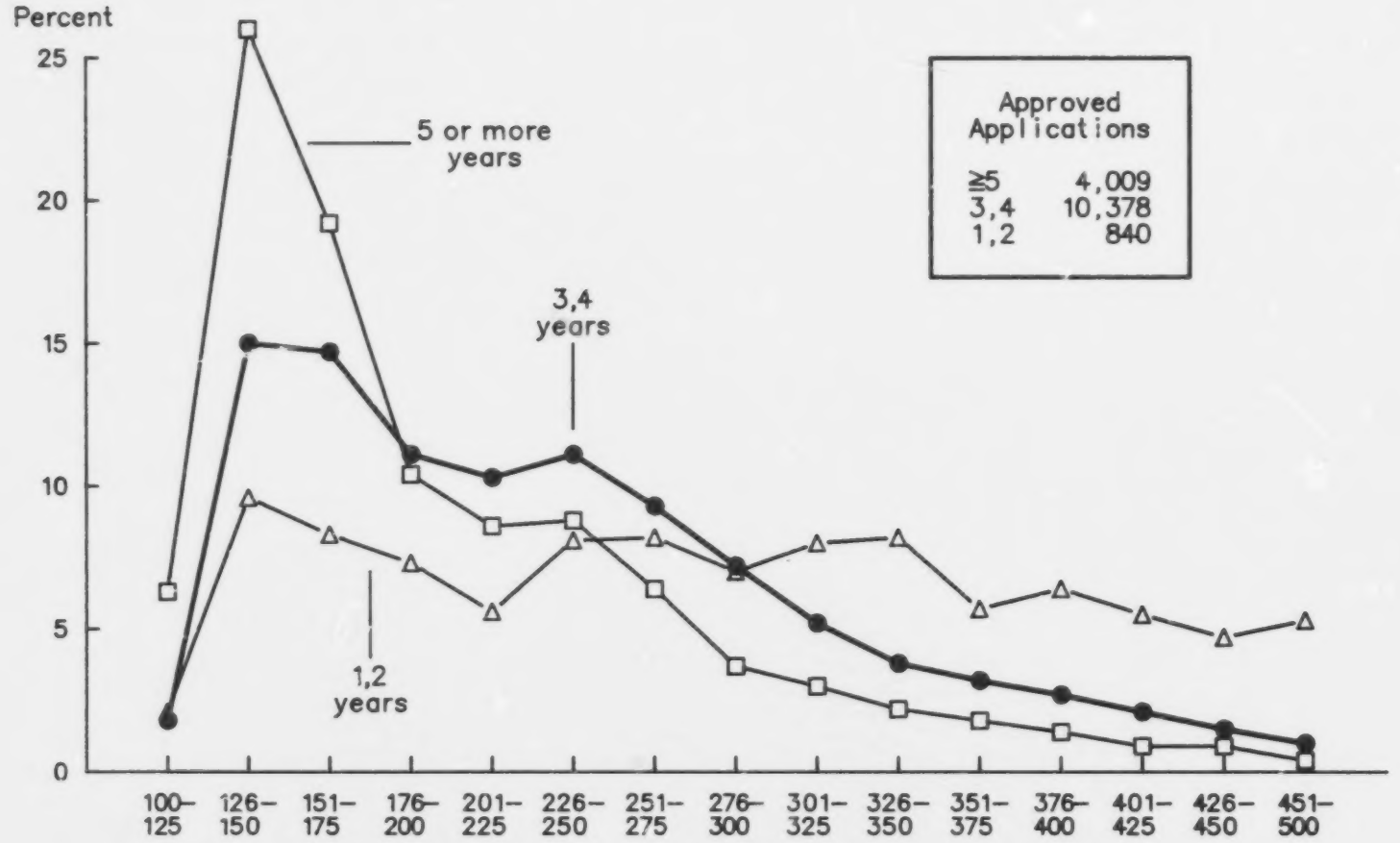
R01 approval rates as well as the distribution of priority scores differ dramatically according to the years of requested support. Requests for 5 or more years of support have higher approval rates and better scores than requests for 3 or 4 years and still better than requests for only 1 or 2 years. In 1985, recommended approval rates ranged from 72 percent of applicants seeking 1 or 2 years to 95 percent of those seeking 5 or more years of support. Differences are most pronounced in new applications; as expected, applications for renewal show high rates of approval in all groups.

	Recommended Approval Rates			Percent with Scores 100-175*		
	1&2	3&4	>4	1&2	3&4	>4
Total						
1975	54.3	72.8	80.6	8.0	13.1	26.2
1980	57.1	80.2	88.6	9.2	14.2	29.0
1983	68.3	88.9	94.2	14.4	24.4	42.7
1985	72.4	92.2	95.1	15.0	29.3	49.2
1980-85	15.3	12.0	6.5	5.8	15.1	20.2
New Applications						
1975	52.1	69.0	71.6	7.6	11.4	17.5
1980	54.7	77.6	80.6	7.9	12.3	17.5
1983	66.5	86.6	89.3	12.8	21.5	30.8
1985	73.4	91.6	91.6	13.8	25.0	33.9
1980-85	18.7	14.0	11.0	5.9	12.7	16.4
Competing Renewals						
1975	77.0	86.5	91.0	12.3	19.5	36.1
1980	82.4	91.5	96.2	22.1	22.5	39.7
1983	92.6	96.2	98.5	35.8	33.5	53.2
1985	93.3	97.7	98.9	32.0	44.8	62.0
1980-85	10.9	6.2	2.7	9.9	22.3	22.3

*Based on reviewed applications by FY of IRG review.

Since 1980, all three groups have shown an increase in the proportion of R01 applications with scores 100-175. Those requesting 5 or more years have improved the most -- from 29.0 percent to 49.2 percent of reviewed applications or an increase of 20.2 percentage points. This is considerably higher than the 5.8 point increase among applications requesting 1 or 2 years of support and the 15.1 point increase in those requesting 3 or 4 years.

Priority Score Distributions of DRG Approved R01 Applications by Requested Years of Support, FY 1985*



*Summarized by fiscal year of IRG review; excludes withdrawals and supplements.
Over 5 includes .03% of applications.
Source: NIH, DRG, Statistics and Analysis Branch

8706-W2

There are striking differences in priority score distributions based on the number of years of requested support. Of the 4,000 approved applications requesting 5 or more years of support in 1985, 32.3 percent received scores of 150 or better -- almost double the 16.8 percent on applications requesting 3 or 4 years, and three times the 11.7 percent with 1 or 2 year requests.

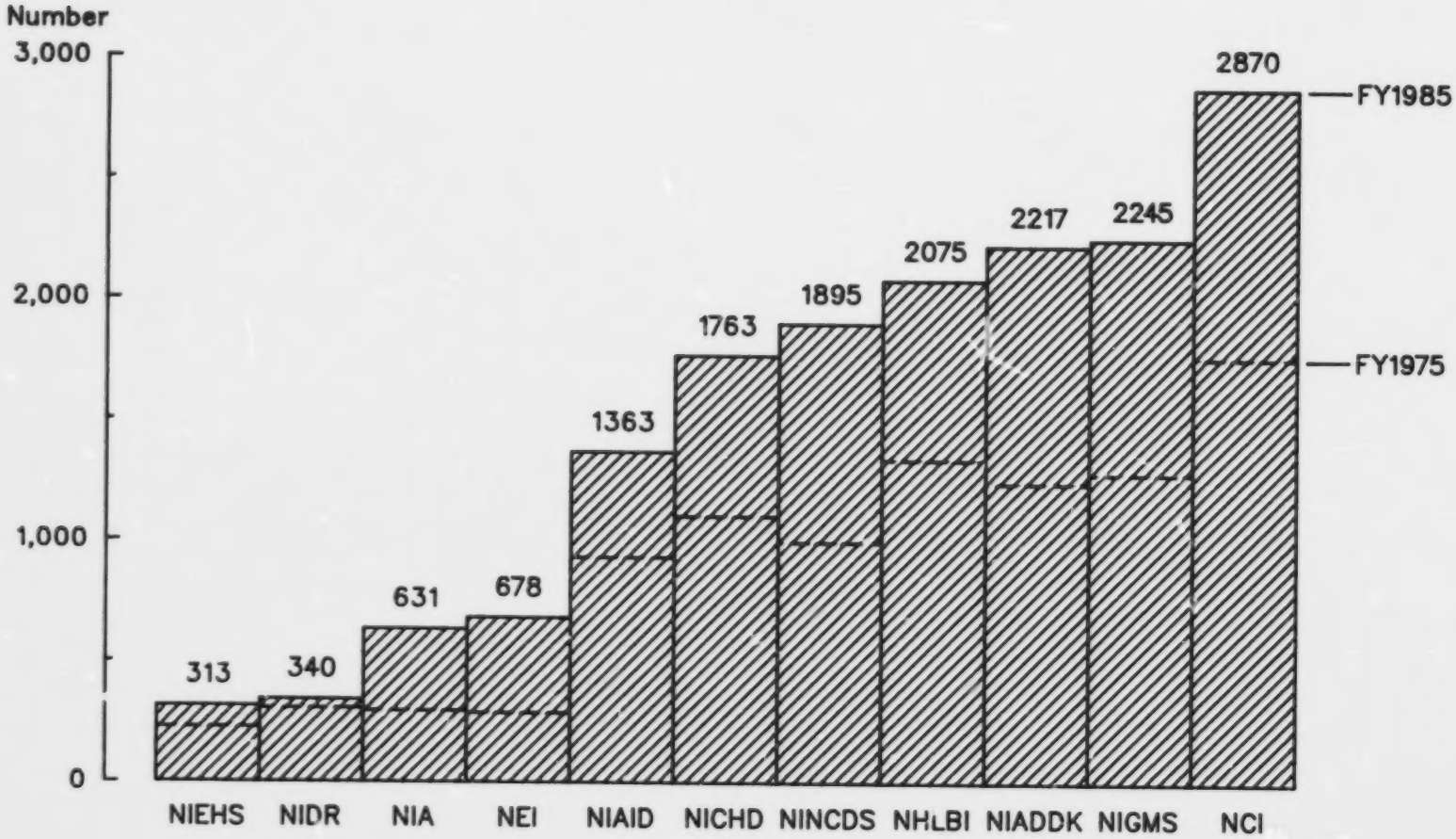
	1975			1985		
Scores	1,2	3,4	>4	1,2	3,4	>4
100-125	1.4	1.8	6.3	2.1	1.8	6.3
126-150	4.8	5.7	12.3	9.6	15.0	26.0
150-175	8.5	10.6	13.9	8.3	14.7	19.2
176-200	12.1	12.0	14.6	7.3	11.1	10.4
201-300	35.0	39.2	34.0	28.9	37.9	27.5
>300	38.2	30.8	18.8	43.8	19.5	10.6
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number*	768	4,358	2,027	840	10,368	4,009
Mean	277	259	226	282	232	199
St. dev.	92.8	84.4	81.4	102.0	81.7	73.3
C.V.	33.5	32.6	36.0	36.1	35.2	36.8

*Approved applications by fiscal year of IRG review.

Applications requesting 5 or more years of support include a much higher proportion of renewals than the other two groups. Nevertheless, the number of years requested is a factor with a strong relationship to the scores of both new and renewal applications (pages 47, 49).

	Number of Approved Applications			Percent Renewals		
	1,2	3,4	>4	1,2	3,4	>4
1975	768	4,358	2,027	12.2	25.6	52.7
1980	845	7,176	2,816	12.8	21.2	55.9
1985	840	10,368	4,009	8.3	22.6	56.3

Number of Competing R01 Applications* by Assigned Institute FY1975 vs FY1985



*Original and amended applications summarized by fiscal year of IRG review.
Excludes withdrawals and supplements.
Source: NIH, DRG, Statistics and Analysis Branch

8706-W49

BEST COPY AVAILABLE

Competing applications are assigned to the appropriate NIH institute and study section or institute review group by DRG's Referral and Review Branch. Assignments are made on the basis of both the overall mission and specific program interests of each institute. The following data are summarized by the primary administering institute.

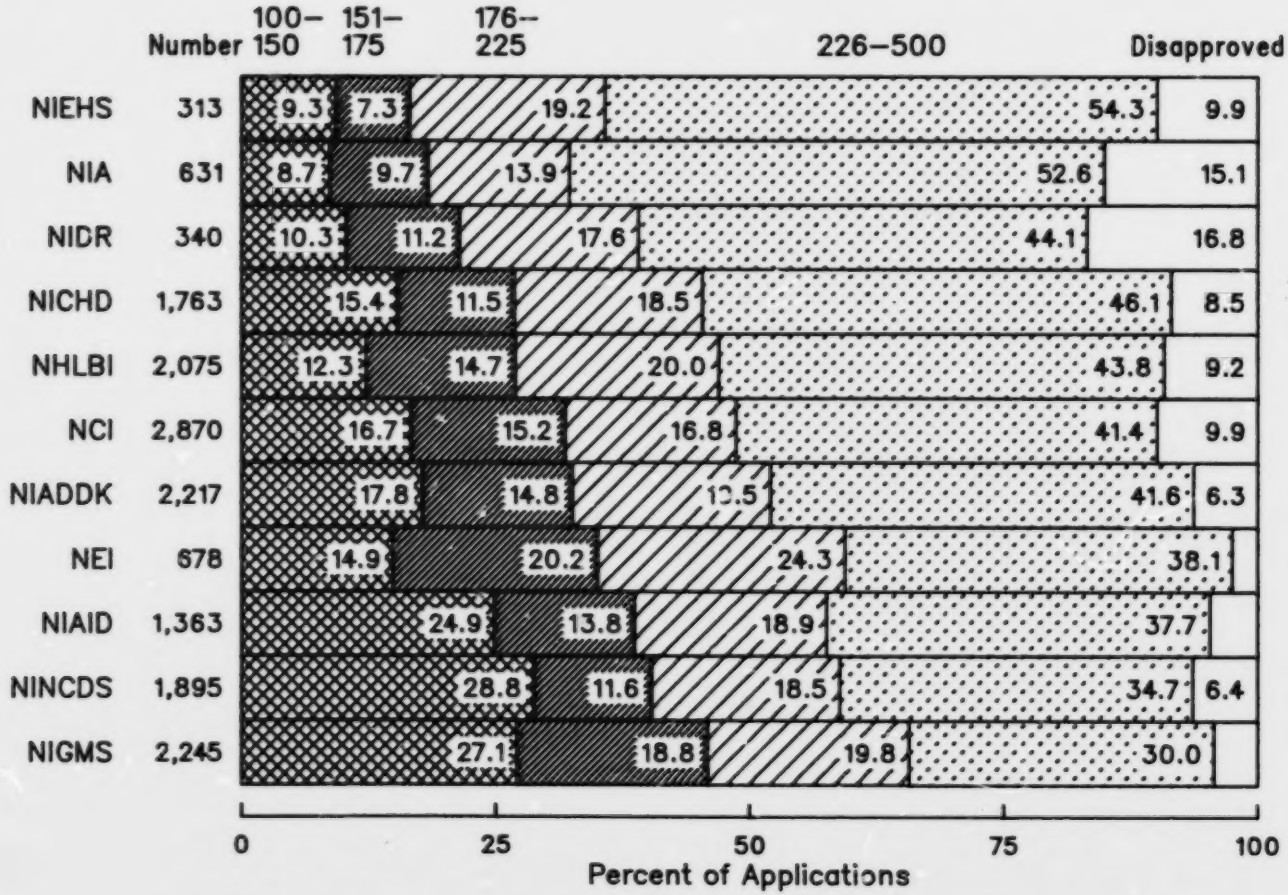
The Cancer Institute (NCI) was assigned the largest share of R01 applications throughout the past decade -- about 18 percent of the NIH total in both 1975 and 1985. The second largest institute in 1975 -- Heart, Lung and Blood (NHLBI) -- dropped from 13.7 to 12.7 percent of the NIH total and is now preceded by General Medicine (NIGMS) and Arthritis, Diabetes and Digestive and Kidney Diseases (NIADDK). Environmental Health (NIEHS), Dental Research (NIDR), Aging (NIA), and the Eye Institute (NEI) each were assigned less than 5 percent of the total R01 applications in 1985.

The number of R01 applications reviewed for the Dental Institute in 1985 is only 11.8 percent greater than 1975, while applications for Aging and the Eye Institute more than doubled during this period. The Eye Institute has consistently had a larger proportion of renewal applications than any other institute -- 35 percent in 1975 and 44 percent in 1985.

	No. Reviewed*		Increase		Percent Renewal		Recommended Approval Rate	
	1975	1985	1975-1985 No.	%	1975	1985	1975	1985
NIEHS	225	313	88	39.1	19.6	24.6	54.7	90.1
NIDR	304	340	36	11.8	27.3	32.1	55.6	83.2
NIA	294	631	337	114.6	3.1	17.4	61.9	84.9
NEI	286	678	392	137.1	35.7	44.1	85.3	97.5
NIAID	929	1,363	434	46.7	28.7	26.9	83.7	95.3
NICHD	1,099	1,763	664	60.4	22.6	24.8	64.1	91.5
NINCDS	993	1,895	902	90.8	29.9	27.8	74.8	93.6
NHLBI	1,333	2,075	742	55.7	25.7	29.8	72.5	90.8
NIADDK	1,237	2,217	980	79.2	34.3	29.3	76.0	93.7
NIGMS	1,276	2,245	969	75.9	26.3	33.5	79.6	95.7
NCI	1,756	2,870	1,114	63.4	22.7	27.6	68.5	90.1
Range	225-1,756	313-2,870	36-1,114	11.8-137.1	3.1-35.7	17.4-44.1	54.7-85.3	83.2-97.5

*By FY of IRG review; Institutes ranked by number reviewed in 1985.

DRG Study Section Action on Competing R01 Applications* by Assigned Institute, FY1985



Ranked by percent scored 100–175. *Original and amended applications summarized by fiscal year of IRG review; excludes withdrawals and supplements.
Source: NIH, DRG, Statistics and Analysis Branch

8706–W48

BEST COPY AVAILABLE

The distribution of R01 scores differs substantially among the assigned institutes. For example, in 1985, over 40 percent of the NIGMS and NINCDS applications received scores of 175 or better -- about double the proportion with these scores on NIEHS, NIA, or NIDR applications. Comparable score differences among institutes are found in both new and competing renewal applications. The amount of score decline since 1975 also differs among the institutes with NIGMS, NINCDS and NCI showing the largest increase in the proportion of applications scored 100-175.

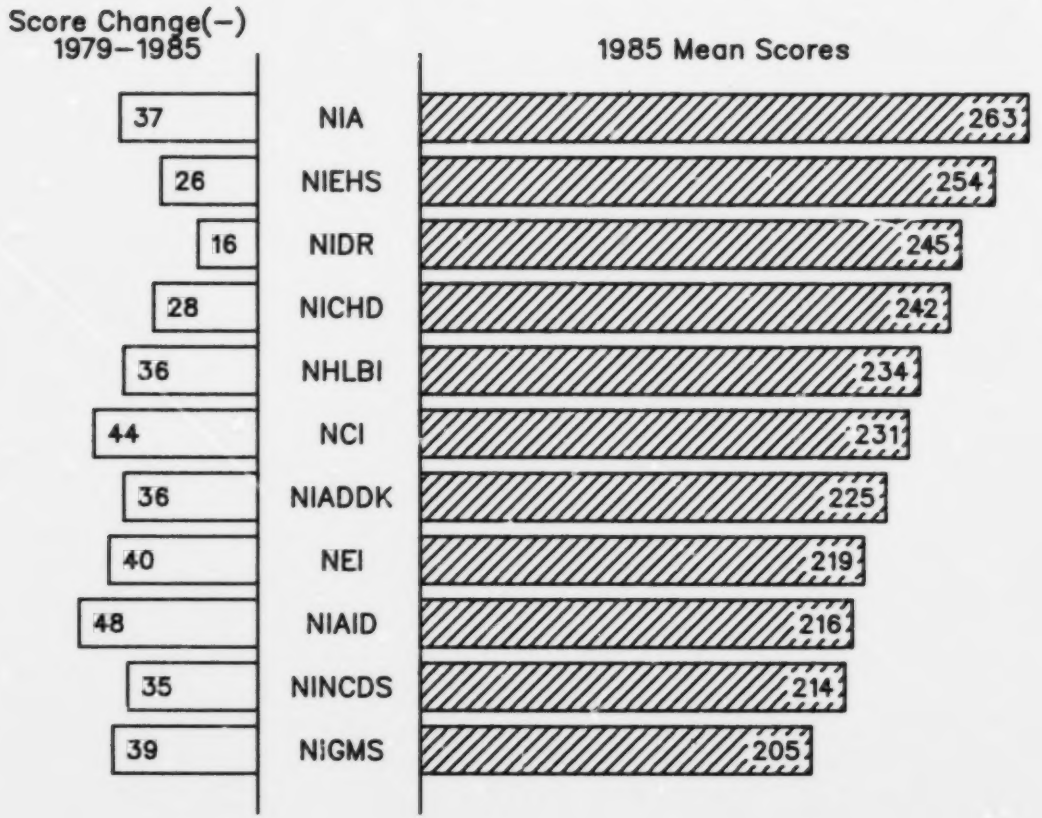
Percent Scored 100-175 *

	Total			New		Renewal	
	1975	1985	Diff.	1975	1985	1975	1985
NIEHS	4.9	16.6	11.7	3.3	14.4	11.4	23.4
NIA	5.8	18.4	12.6	4.6	15.9	-	30.0
NIDR	8.2	21.5	13.3	6.8	12.6	12.0	40.4
NICHD	11.2	26.9	15.7	8.1	21.3	21.8	43.9
NHLBI	16.1	27.1	11.0	12.9	20.2	25.1	43.3
NCI	11.3	31.9	20.6	9.4	24.2	17.3	51.6
NIADDK	17.7	32.7	15.0	11.7	24.1	29.2	53.3
NEI	17.1	35.1	18.0	15.8	26.6	19.6	45.8
NIAID	22.0	38.7	16.7	15.7	30.5	37.5	61.0
NINCDS	18.7	40.4	21.7	14.4	31.4	29.0	63.6
NIGMS	22.8	45.9	23.1	17.4	35.8	37.9	66.1
Range	4.9-22.8	16.6-45.9	11.0-23.1	3.3-17.4	12.6-35.8	11.4-37.9	23.4-66.1

*Based on reviewed applications by FY of IRG review.

Applications of most institutes are reviewed by several different study sections. Since priority score distributions (and means) vary from one study section to another (page 106), the percentile rank of applications within each study section is an aid to institute staff in assessing their relative merit. The percentile rank of each application has been available to those institutes requesting it since the discontinuation of normalized scores in 1980.

Mean Priority Scores of DRG Approved R01 Applications* by Assigned Institute, FY1979 vs. FY1985



*Original and amended applications summarized by fiscal year of IRG review.
Excludes withdrawals and supplements. NLM not shown.
Source: NIH, DRG, Statistics and Analysis Branch

8706–W33

BEST COPY AVAILABLE

In 1985, mean scores ranged from 205 on competing R01 applications assigned to NIGMS to 263 on applications for NIA. Although there were some exceptions and year-to-year variation, the institute rank remained remarkably similar since 1979.

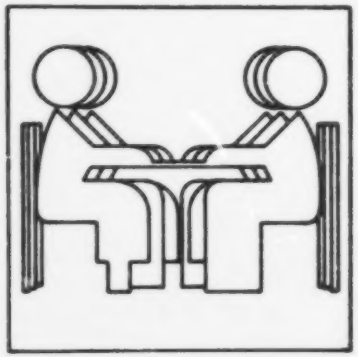
Both new and competing renewal applications followed a similar ranking pattern, as did applications excluding amendments. Factors which are related to overall scores such as the number of years of requested support (page 46), or whether an application is from a basic or clinical department (page 96) influence institute scores but were not the primary cause of institute differences.

Success rates are dependent on the funds available for competing applications in the Institute as well as the priority scores of their applications.

	Mean Scores*			1985 Means		Success Rate**	
	1975	1979	1985	New	Renewal	1975	1985
NIA	306	300	263	271	232	16.6	25.0
NIEHS	270	280	254	260	237	37.3	25.9
NIDR	251	261	245	266	210	42.8	34.0
NICHD	269	270	242	258	199	41.4	23.2
NHLBI	248	270	234	248	205	40.2	29.9
NCI	261	275	231	246	196	43.8	32.4
NIADDK	247	261	225	240	193	46.7	31.1
NEI	230	259	219	232	204	67.2	42.1
NIAID	253	264	216	229	181	41.2	32.8
NINCDS	238	249	214	230	177	50.5	33.4
NIGMS	241	244	205	221	175	51.0	42.1
Total	252	264	226	241	193	44.4	32.4
Range	230-306	244-300	205-263	221-271	175-237	16.6-67.2	23.2-42.1

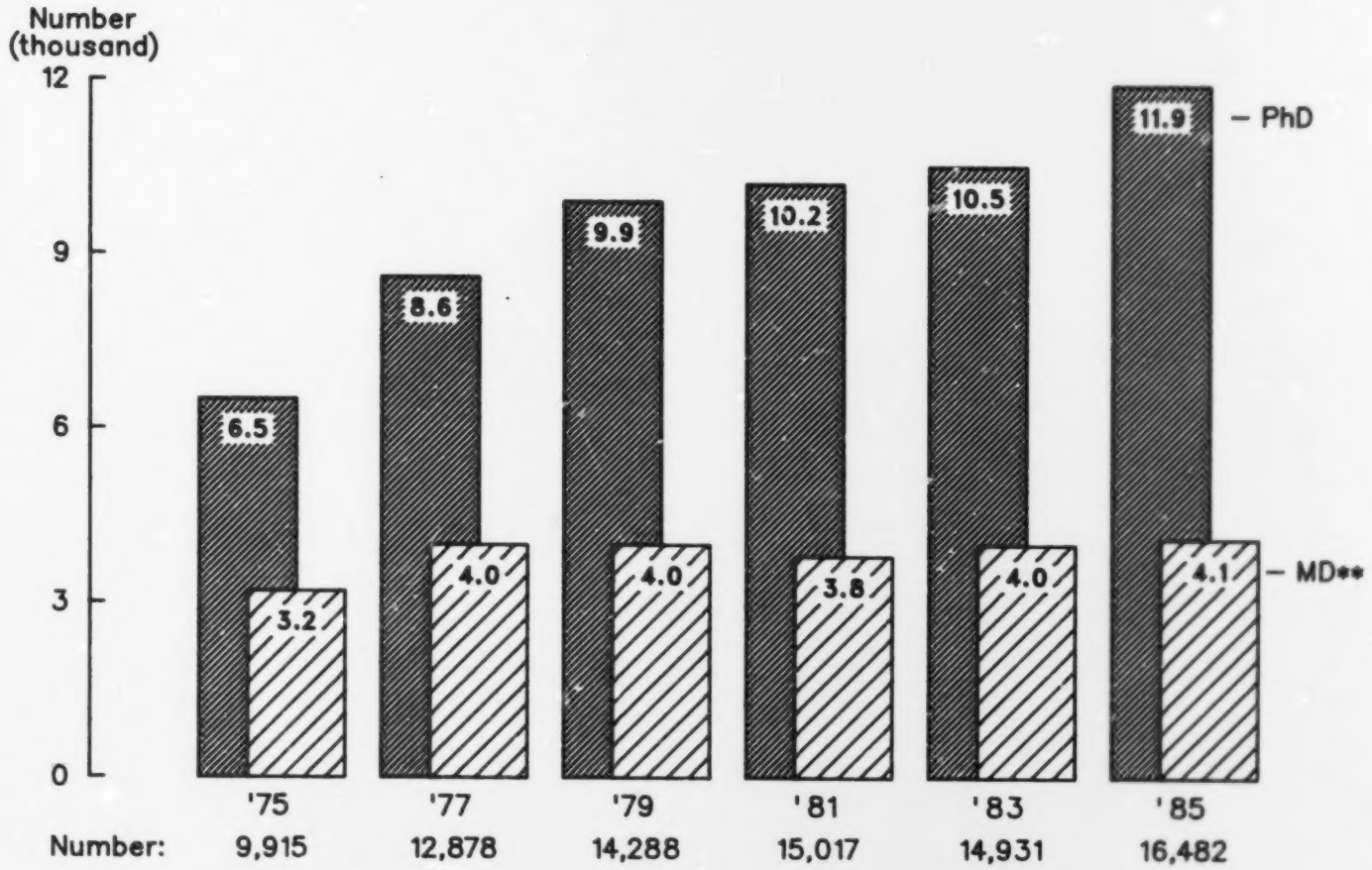
LM, MH, OH not shown. *By fiscal year of IRG review.
** By fiscal year of funds or requested start date from award rate file.

BLANK PAGE



4. PRINCIPAL INVESTIGATOR CHARACTERISTICS RELATED TO STUDY SECTION ACTION
   - Degree of applicant
     - Number of applications
     - Distribution of applications
     - Study section actions: disapprovals, score distribution
     - Mean priority score trends
   - Age of applicant
     - Distribution of applications (total)
     - Distribution of applications (new, renewal)
     - Difference in mean priority scores
   - Sex of applicant
     - Distribution of applications
     - Difference in age
     - Study section actions: disapprovals, score distribution
     - Mean priority scores trends
   - Race/ethnic origin of applicant
     - Distribution of applications
     - Study section actions: disapprovals, score distribution
     - Difference in mean priority scores

Number of Competing R01 Applications* by Degree** of Applicant, FY1975–1985 (selected years)



*Original and amended applications summarized by fiscal year of IRG review.
**MD includes MBBS, MB, DO, and joint MD/PhD degrees.
PhD includes EDD, DSC, and SCD. Other or unknown degrees are not shown.
Source: NIH, DRG, Statistics and Analysis Branch

8706–W40

BEST COPY AVAILABLE

PhD applicants have submitted substantially more R01 applications and shown more growth than MDs during the past 10 years. In 1975, applications from PhDs outnumbered those from MDs by a 2 to 1 margin; by 1985 this ratio approached 3 to 1. Most of the growth in MD applications occurred between 1975 and 1977 increasing from 3,200 to 4,000. After a slight decline in 1980-1981, they rose to only 4,100 by 1985. The difference in the number reviewed in 1985 vs. 1975 was only 960 (+30 percent) compared to the much larger increase of over 5,300 applications (+83 percent) from PhDs. Each showed year-to-year fluctuation within these trends.

If amendments are excluded, the number of original applications from MDs has increased by only 400 -- from 2,700 in 1975 to almost 3,200 in 1985. In sharp contrast, original applications from PhDs increased by 3,300 from 5,600 to 8,900.

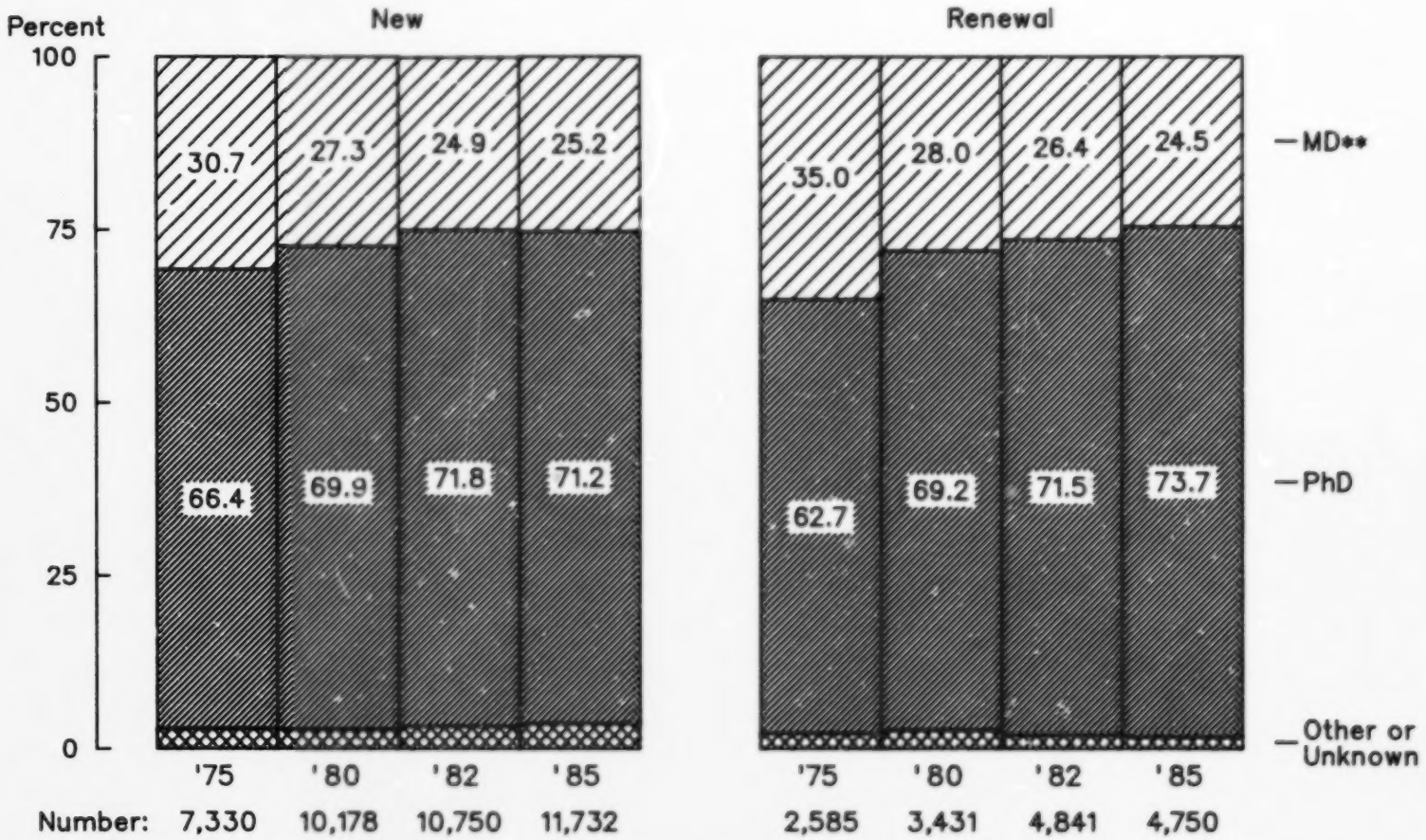
	Reviewed Applications				Excluding Amendments			
	MD*	PhD	Other	NA	MD*	PhD	Other	NA
1975	3,157	6,490	205	63	2,743	5,604	183	55
1976	3,594	7,466	239	42	3,155	6,493	206	37
1977	3,971	8,622	247	38	3,542	7,393	218	31
1978	3,934	8,956	273	44	3,313	7,414	235	34
1979	3,983	9,930	317	58	3,421	8,483	279	55
1980	3,739	9,489	318	63	3,192	7,901	265	56
1981	3,800	10,184	293	740	3,199	8,502	249	615
1982	3,959	11,182	280	170	3,222	8,807	239	140
1983	3,996	10,545	251	139	3,111	8,112	206	118
1984	4,067	11,093	309	153	3,153	8,497	250	134
1985	4,118	11,854	268	242	3,170	8,885	203	199
75-85 No.	961	5,364	63		427	3,281	20	
%	+30.4	+82.7	+30.7		+15.6	+58.5	+10.9	

*MD includes MBBS, MB, DO and joint MD/PhD.
Summarized by fiscal year IRG review.

The above data indicate a slightly higher proportion of amended applications from PhD applicants. Amendments as a percent of reviewed R01 applications are as follows:

	MD	PhD	Other	Total
1975	13.1%	13.7%	10.7%	13.4%
1980	14.6	16.7	16.7	16.1
1983	22.1	23.1	17.9	22.7
1985	23.0	25.0	24.3	24.4

Distribution of Competing New and Renewal R01 Applications* By Degree** of Applicant, FY 1975–1985 (selected years)



*Original and amended applications summarized by fiscal year of IRG review;
**MD includes MBBS, MB, DO, and joint MD/PhD degrees. PhD includes EDD, DSC, SCD.
Source: NIH, DRG, Statistics and Analysis Branch

8706-W38

BEST COPY AVAILABLE

The proportion of MD applicants is declining on both new and competing renewal R01 applications. New applications from MDs dropped from 30.7 percent in 1975 to 25.2 in 1985--down 5.5 percentage points. The proportion of competing renewals from MDs is down 10.5 percentage points from 35.0 to 24.5 percent. The latest 1986 data shows a small but continuing decline.

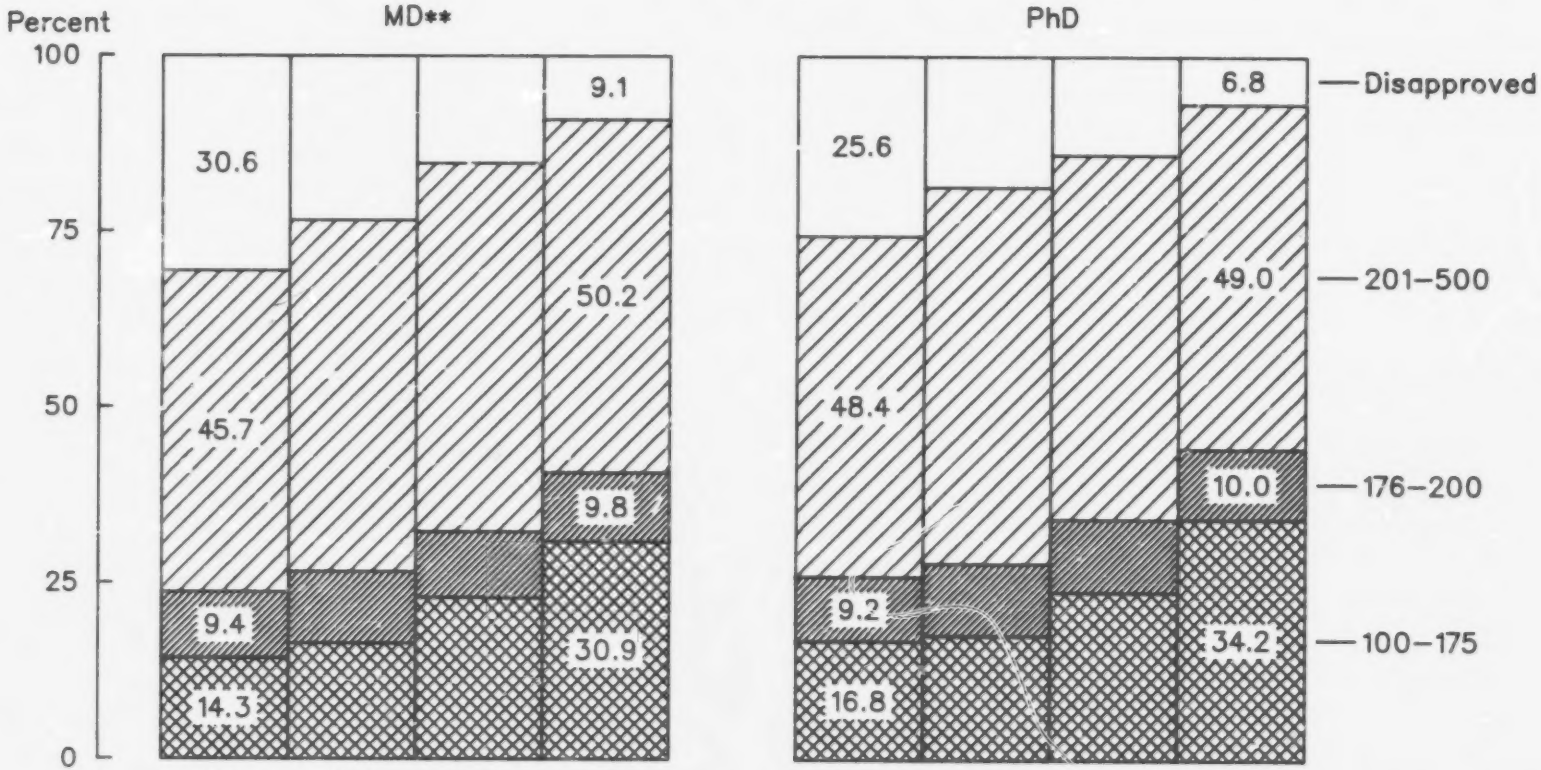
	New Applications		Competing Renewals	
	Number	% MD*	Number	% MD*
1975	7,330	30.7	2,585	35.0
1980	10,178	27.3	3,431	28.0
1982	10,750	24.9	4,841	26.4
1984	11,125	26.0	4,498	26.1
1985	11,734	25.2	4,753	24.5
1986	10,020	25.0	5,266	24.0
1975-80	2,848	-3.4	846	-7.0
1980-85	1,556	-2.1	1,322	-3.5

*MDs include MBBS, MB, DO and joint MD/PhD.
Summarized by FY of IRG review.

In 1985, MD applicants submitted only 701 more new applications and 260 more competing renewals than in 1975. In contrast, new applications from PhDs increased by 3,485 and renewals by 1,879. Both are considerably lower if amendments to previously submitted applications are excluded. The uncertainty of sustained research funding as well as the gap in earning potential are frequently cited reasons for this lack of growth in physician investigators. However, other grant activities targeted for the medical scientist have shown recent growth. These include the Clinical Investigator Award (K08) and Physician Scientist Award (K11, 12) -- all reviewed by institute review panels.

	New		Renewal		Excluding Amendments: New		Excluding Amendments: Renewal	
	MD*	PhD	MD*	PhD	MD*	PhD	MD*	PhD
1975	2,251	4,869	906	1,621	1,978	4,242	765	1,362
1980	2,777	7,115	962	2,374	2,373	5,943	819	1,958
1985	2,952	8,354	1,166	3,500	2,297	6,323	873	2,562
1975-80	526	2,246	56	753	395	1,701	54	596
1980-85	175	1,239	204	1,126	-76	380	54	604

DRG Study Section Action on Competing R01 Applications*
By Degree** of Applicant, FY 1975–1985 (selected years)



*Original and amended applications summarized by fiscal year of IRG review; **MD includes MBBS, MB, DO, and joint MD/other degrees. Excludes less than 1.5% with degree unknown.
Source: NIH, DRG, Statistics and Analysis Branch

8706-W36

BEST COPY AVAILABLE

MD applicants have a higher rate of disapproval and a lower percent of scores in the 100-175 range than PhD applicants. Differences between MD and PhD rates range from 1 to 5 percentage points each year.

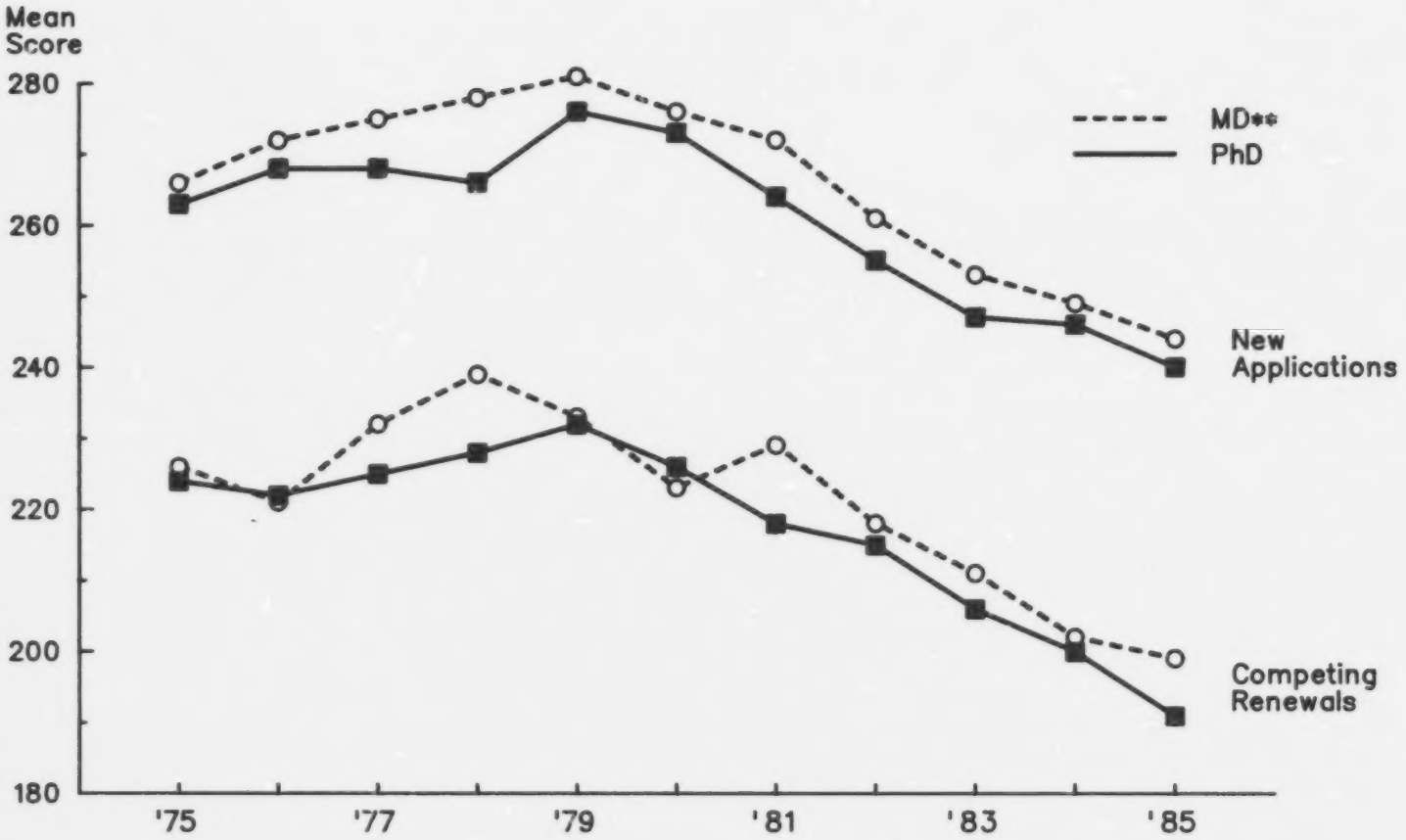
Disapproval of applications from MDs declined by 21.5 percentage points since 1975--from 30.6 percent in 1975 to only 9.1 percent in 1985. PhD applicants, with a slightly lower disapproval rate, declined by 18.8 points from 25.6 to 6.8 percent. An increasing proportion of applications from both MD and PhD applicants are receiving scores in the 100-175 range. Applications with these excellent scores increased from 14.3 to 30.9 percent for MD applicants and from 16.8 to 34.2 percent for PhDs.

	Percent Disapproved		Percent 100-175	
	MD*	PhD	MD*	PhD
1975	30.6	25.6	14.3	16.8
1976	30.1	26.9	15.6	15.6
1977	27.6	22.2	15.9	17.3
1978	23.7	20.7	14.7	19.5
1979	23.3	21.2	16.0	16.5
1980	23.4	18.6	16.4	17.6
1981	17.7	16.0	18.8	20.4
1982	15.3	14.0	22.9	23.8
1983	13.4	10.2	25.5	29.0
1984	12.0	9.4	28.4	30.9
1985	9.1	6.8	30.9	34.2
1975-85	-21.5	-18.8	+16.6	+17.4

*MD includes joint MD/PhD.
Based on reviewed applications by FY of IRG review.

Applicants coded as joint MD/PHD have been included with MDs throughout because of uncertainty about the accuracy of this data item. Data are currently under review.

Mean Priority Scores of Competing R01 Applications* by Degree** of Applicant, FY 1975–1985



*Original and amended applications summarized by fiscal year of IRG review. Excludes less than 1.5% with degree unknown. **MD includes MBBS, MB, DO, and joint MD/PhD degrees. PhD includes EDD, DSC, and SCD.
Source: NIH, DRG, Statistics and Analysis Branch

8708-W37

In general, PhDs average slightly better scores than MDs (including MD/PhD) on both new and competing renewal R01 applications. Mean score differences usually have been less than 8 points.

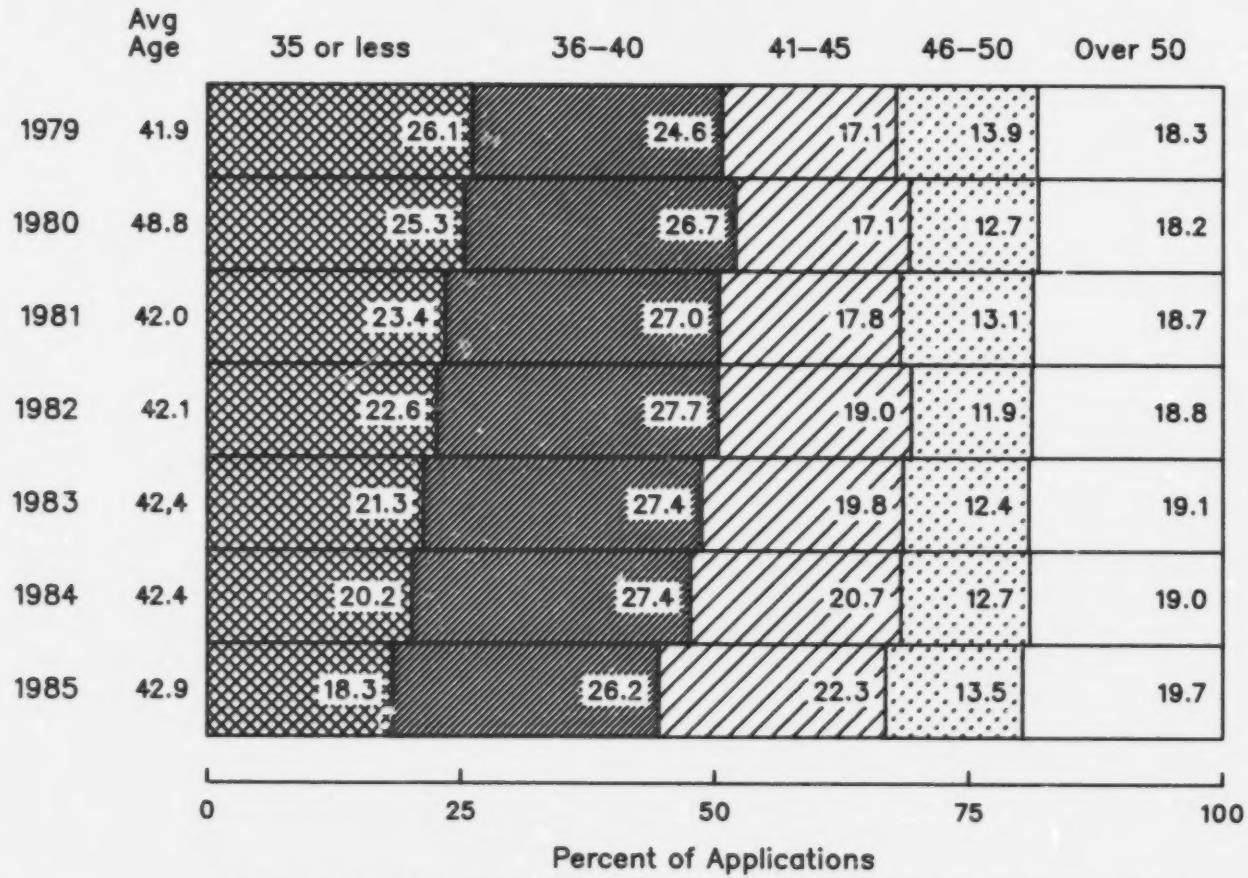
	New Applications		Competing Renewals	
	MD**	PhD	MD**	PhD
1975	266	263	226	224
1977	275	268	232	225
1979	281	277	233	232
1981	272	264	229	218
1983	253	247	211	206
1985	244	240	199	191

Regardless of the degree of the applicant, average scores are better on applications from basic science departments than from clinical or other departments (page 96). Comparisons in which PhDs score better than MDs reflect the high proportion of PhD applicants from the better scoring basic science departments. PhDs from clinical departments average almost identical scores to MDs; and PhDs from basic science departments average poorer scores than MDs (except for 1985).

	Number Reviewed*		Mean Scores	
	MD**	PhD	MD**	PhD
Basic Science				
1979	729	5,386	249	257
1982	709	5,979	231	233
1983	711	5,658	221	227
1984	709	5,905	216	223
1985	726	6,334	221	216
Clinical Science				
1979	2,207	1,319	271	270
1982	2,260	1,733	249	254
1983	2,271	1,605	246	245
1984	2,320	1,756	239	239
1985	2,375	1,887	231	232
Other Departments				
1979	102	1,711	275	273
1982	*	1,695	*	256
1983	106	1,658	243	250
1984	*	1,757	*	255
1985	*	1,773	*	251

*Less than 100 applications. **MD includes joint MD/PhD.
From institutions of higher ed; summarized by FY of IRG review.

Distribution of DRG Reviewed R01 Applications* by Age** of Principal Investigator, FY1979–1985



*Competing applications summarized by requested start date or fiscal year of funds. Excludes applications with age unknown. **Age computed as of October.
Source: NIH, DRG, Statistics and Analysis Branch

8611-W9

BEST COPY AVAILABLE

The age of principal investigators submitting R01 applications has been recorded in the IMPAC data system since 1979. Nonresponse to this item ranges from 2 to 6 percent with the exception of 1983 (14 percent due to data processing error).

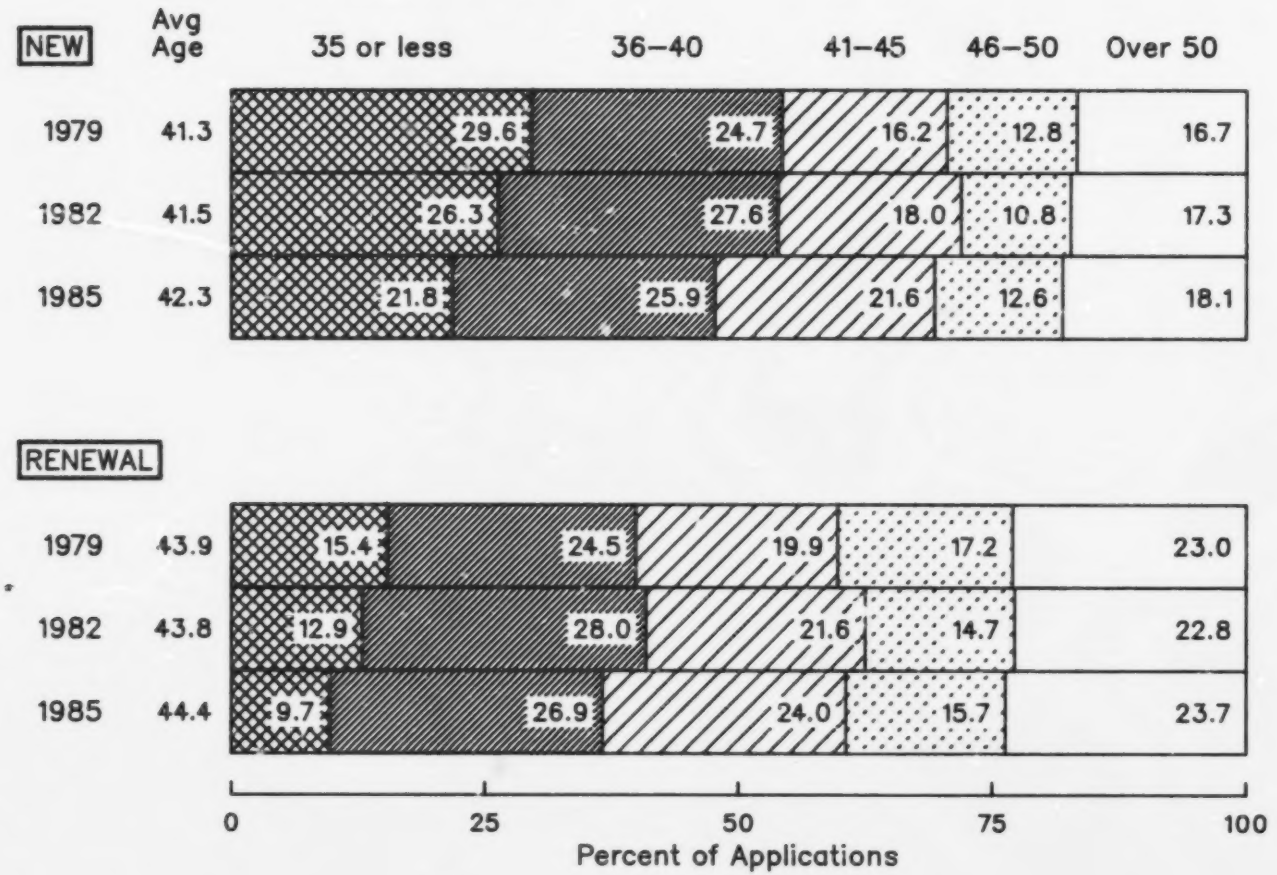
The major change in the age of R01 applicants has been a steady, annual decline in the proportion who are 35 years of age or younger -- 26.1 percent of applications in 1979 down to only 18.3 percent in 1985. This includes an annual decline in the small group of applications from those who are 26 to 30 (4.5 percent in 1979 to 2.1 in 1985). There is a corresponding increase from applicants 36 to 45 years of age, while the proportion over 45 remains stable -- 32.2 percent in 1979 and 33.2 percent in 1985. This gradual shift in age distribution is reflected by a one year increase in the average age of applicants since 1979 from 41.9 to 42.9 in 1985. Recent 1986 data indicate a continuing decline in applicants under 36.

		Percent of Applications				
	Number*	< 36	36-45	46-55	56-65	>65
1979	13,286	26.1	41.7	23.0	8.2	0.9
1980	13,125	25.3	43.8	21.8	8.1	1.0
1981	13,961	23.4	44.8	22.1	8.3	1.3
1982	14,740	22.6	46.7	21.2	8.4	1.1
1983	12,961	21.3	47.2	21.6	8.6	1.4
1984	14,329	20.2	48.1	21.8	8.5	1.4
1985	16,024	18.3	48.5	22.3	9.6	1.4
1986	15,311	13.4	50.1	24.6	10.2	1.7
1979-85		-7.8	+6.8	-0.7	+1.4	+0.5

*Reviewed applications with age recorded.

A similar age trend is found in both new and competing renewal applicants (page 70) and in men and women (page 76).

Distribution of New and Renewal R01 Applications* by Age** of Principal Investigator, FY1979, 1982, 1985



*Competing applications summarized by requested start date or fiscal year of funds. Excludes applications with age unknown. **Age computed as of October.
Source: NIH, DRG, Statistics and Analysis Branch

8611-W10

BEST COPY AVAILABLE

New and competing renewal applications, originals and amendments all confirm the decline in the proportion of applications from investigators 35 years or younger. In new applications, this proportion declined 7.8 percentage points since 1979 -- from 29.6 to 21.8 percent in 1985. Competing renewals showed a somewhat smaller decline -- down 5.7 points from 15.4 percent in 1979 to 9.7 in 1985. Each included steady declines in the 26 to 30 age group; 5.8 down to 2.8 percent for new applications; 0.7 declined to 0.3 percent in competing renewals. Amendments show a lower but also declining percent of applications from the 35 or under group.

Percent of applications from 35 or under age group:

	New Applications*			Competing Renewals*		
	Total	Non-Amend.	Amend.	Total	Non-Amend.	Amend.
1979	29.6	29.4	26.7	15.4	16.1	12.0
1982	26.3	26.4	24.3	12.9	13.8	9.3
1985	21.8	22.1	18.7	9.7	10.1	8.1
1979-85	-7.8	-7.3	-8.0	-5.7	-6.0	-3.9

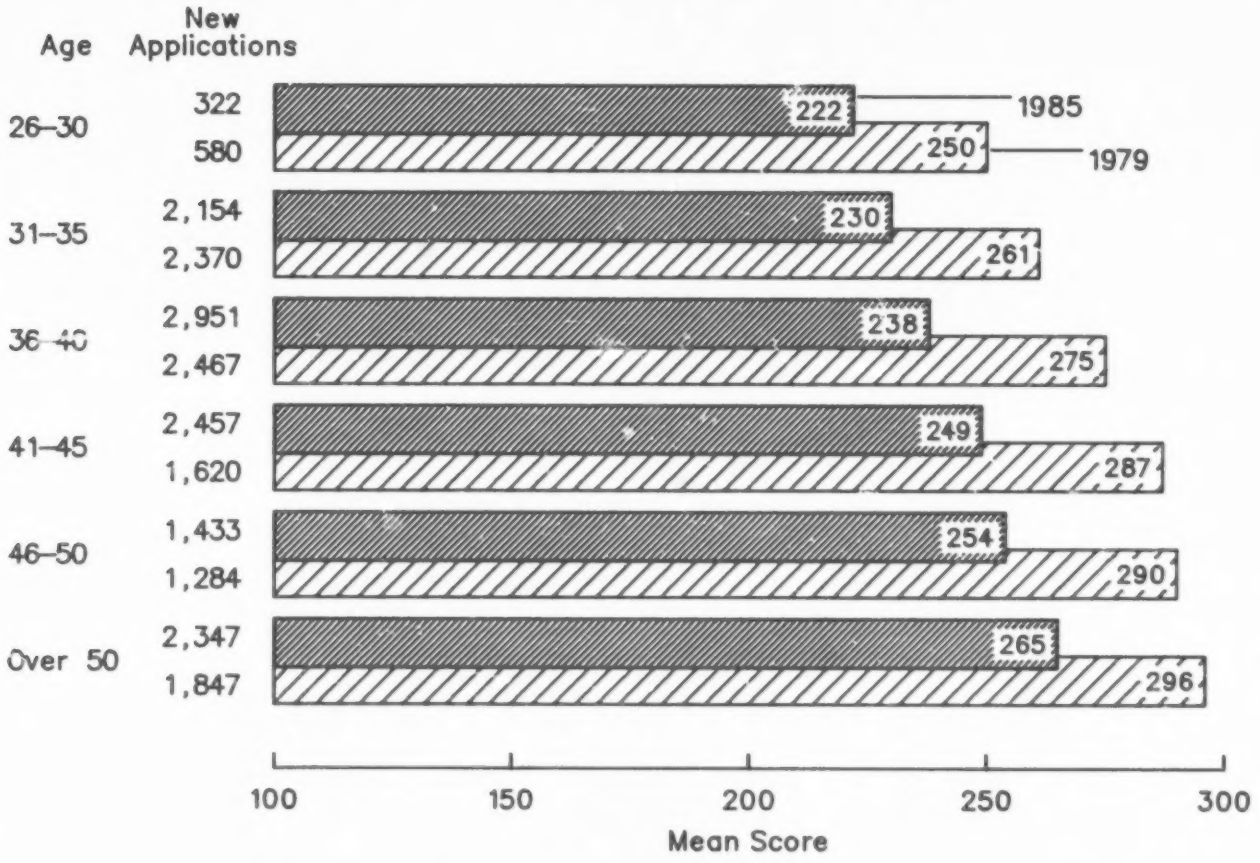
*Based on applications with response to age.

As younger R01 applicants declined, applications for New Investigator Research Awards (R23) and Research Career Development Awards increased. Although some of the decline in younger R01 applicants may be attributed to shifts to the R23 program, it should be noted that most of the R23 growth occurred prior to 1982, while the number of younger R01 applicants still continues to decline.

	1979	1982	1985	Difference 1979-1985
R01 (New)*				
26-30 yrs.	609	467	330	-279
31-35	2508	2387	2209	-299
R23	472	999	1072	+600
Career Dev.(total)	622	597	825	+203
DRG rev.	467	368	275	
Inst. rev.	155	229	550	

*R01 estimates based on applications with response to age.
Data summarized by fiscal year of funds or requested start date.

Mean Priority Scores of New R01 Applications* by Age** of Principal Investigator, FY1979, FY1985



*DRG approved applications summarized by fiscal year of funds or requested start date; excludes withdrawals and supplements.
**Age not available prior to 1979.
Source: NIH, DRG, Statistics and Analysis Branch

8706–W14

Ironically, it is the declining 26 to 35 age group that receive the best scores and are the most successful in obtaining NIH funding. This occurs primarily on new applications with less relationship between scores and age of applicant on competing renewals. In FY 1985, scores for type 1 applicants between 26 and 30 years of age averaged 222 compared to 238 and 254 for applicants 36 to 40 and 46 to 50 respectively; for each 10 years of age, the average score increased by 16 points. Few applicants for competing renewals are in the 26 to 30 age group; however, applicants 31 to 45 average better scores than those 46 or over.

These scores translate into substantially higher success rates for younger principal investigators with new applications. FY 1985 rates range from a high of 30.4 percent in the 26 to 30 age group to only 14.8 for applicants over 50. Age shows a weaker relationship to the success of competing renewals although applicants over 55 have declining success rates.

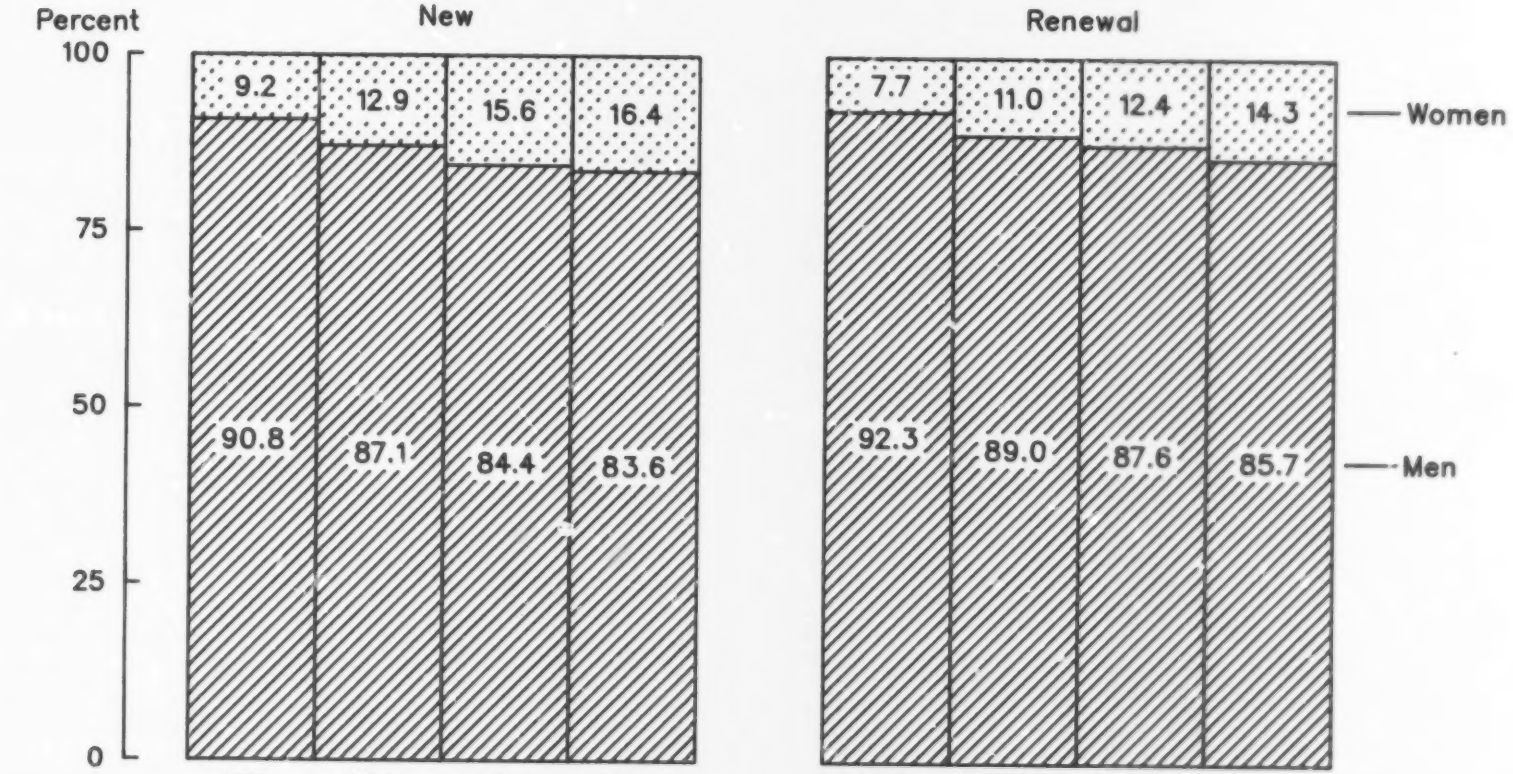
	Mean Scores				Success Rates **			
	New		Renewal		New		Renewal	
Age	1979	1985	1979	1985	1979	1985	1979	1985
26-30	250	222	*	*	40.2	30.4	*	*
31-35	261	230	229	193	37.7	28.0	58.9	50.3
36-40	275	238	234	194	32.0	24.3	55.7	50.1
41-45	287	249	233	192	26.3	21.8	56.3	51.5
46-50	290	254	234	198	24.3	17.9	58.4	48.4
51-55	294	263	237	196	21.6	15.4	54.9	51.5
56-60	295	271	235	199	23.3	13.4	53.8	48.6
61-65	297	263	233	206	20.7	14.2	53.9	44.7
66-70	308	254	235	217	20.8	21.3	51.6	37.9

* Less than 50 approved applications. By fiscal year of funds or requested start date. ** Awards as a percent of number reviewed.

Both original applications and amendments show similar trends -- better scores for younger applicants submitting new applications, but only slight relationship to age on renewals. Mean priority scores for FY 1985 applications are as follows:

	Non-amendments			Amendments		
Age	Total	New	Renewal	Total	New	Renewal
26-30	222	224	*	204	207	*
31-35	225	232	191	219	223	199
36-40	226	242	192	218	228	198
41-45	235	257	189	215	223	199
46-50	237	261	195	226	236	207
>50	242	272	194	232	245	212

Distribution of Competing New and Renewal R01 Applications* by Sex of Applicant, FY1975–1985 (selected years)



	New				Renewal			
Number:	7,330	10,139	9,392	9,893	2,585	3,423	3,568	3,967
Resp. Rate:	100.0	99.6	87.4	84.3	100.0	99.8	73.7	83.5

*Includes original and amended applications summarized by fiscal year of IRG review.
Excludes withdrawals, supplements, and non response.
Source: NIH, DRG, Statistics and Analysis Branch

8706-W18

Prior to July 1981, the sex of the principal investigator was furnished by all R01 applicants and captured in the IMPAC data system. Since 1981, this data has been requested on a voluntary basis and is recorded in encryption form. Unfortunately, this has resulted in substantial nonresponse to this item and less reliability in the data for years 1981 to 1985. Response rates to this item are as follows: 1975-80: 100%, 1981: 90%, 1982: 86%, 1983: 75%, 1984-85: 84%. Applications without response to sex are excluded.

R01 applications reviewed by DRG study sections have shown a steady, annual increase in the proportion from women -- almost doubling since 1975 from 8.8 to 15.8 percent of the 1985 competing applications. Growth was relatively even throughout the 10 year period with an increase of 3.6 percentage points from 1975-1980, and 3.4 points from 1980-1985. Increases in the proportion from women were found in both new and competing renewal applications, but with the expected 3-4 year lag among renewals.

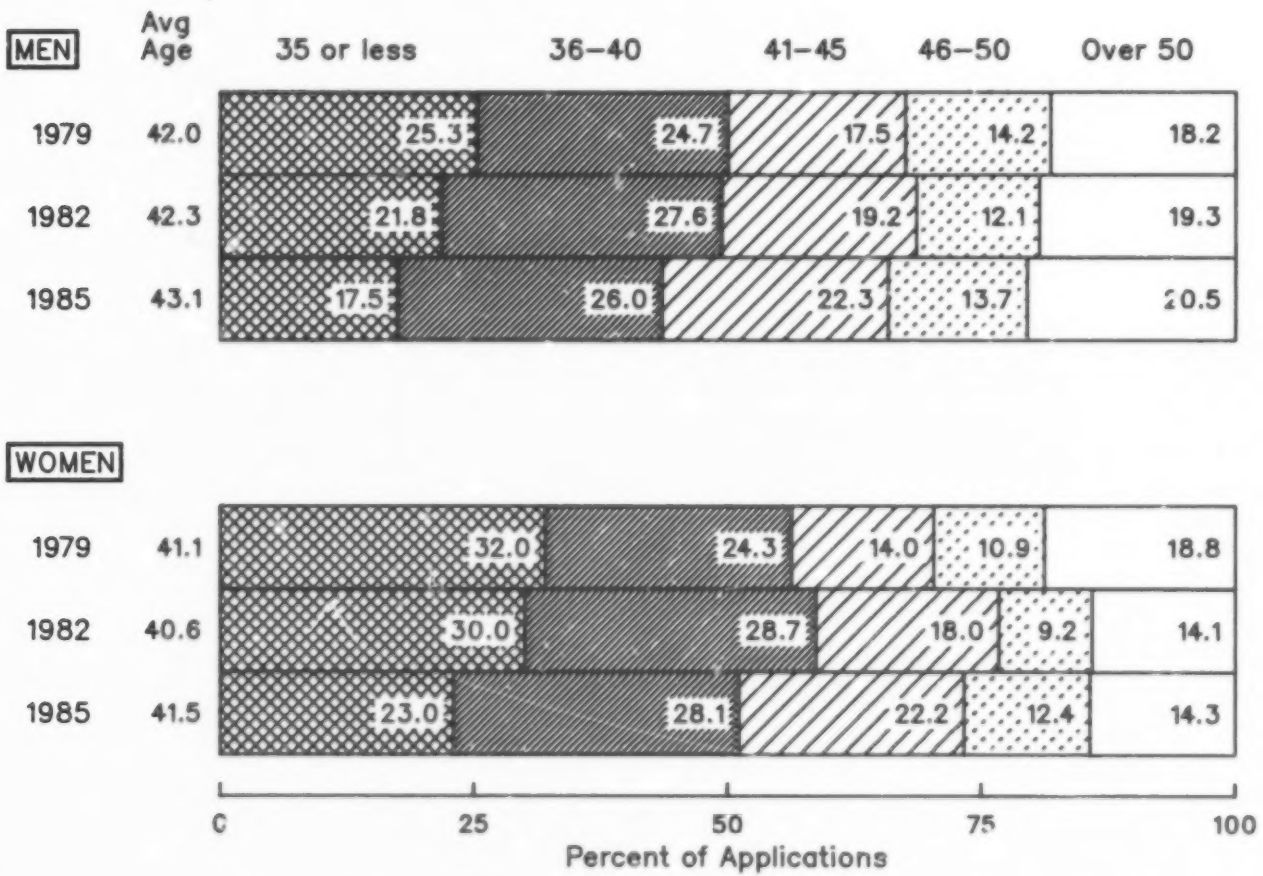
	Total		New		Competing Renewal	
	Number*	%W	Number*	%W	Number*	%W
1975	9,915	8.8	7,330	9.2	2,585	7.7
1976	11,341	9.4	8,460	10.0	2,881	7.9
1977	12,878	10.5	9,235	11.1	3,643	9.2
1978	13,200	11.1	9,509	11.7	3,691	9.6
1979	14,264	12.3	10,721	13.2	3,543	9.6
1980	13,562	12.4	10,139	12.9	3,423	11.0
1981	13,237	13.1	8,921	13.7	4,316	12.0
1982	12,960	14.7	9,392	15.6	3,568	12.4
1983	10,891	14.8	7,950	15.6	2,941	12.6
1984	13,344	15.7	9,379	16.8	3,965	13.0
1985	13,860	15.8	9,893	16.4	3,967	14.3
1986	12,849	16.0	8,471	16.6	4,378	15.0

*Number with sex reported; summarized by fiscal year of IRG review.

Prior to 1985, women submitted fewer amendments to new applications than men; however, women have consistently amended a higher proportion of their renewals, suggesting that they try harder to retain NIH funding for their projects. Amendments as a percent of reviewed R01 applications are as follows:

	New		Renewal	
	Men	Women	Men	Women
1980	16.0	15.2	16.8	17.3
1981	16.4	13.7	15.6	17.8
1982	18.5	17.4	22.9	31.0
1983	20.2	18.8	27.5	29.6
1984	22.2	20.9	24.0	26.8
1985	23.2	23.6	24.5	27.9

Distribution of Competing R01 Applications*
by Age and Sex of Principal Investigator, FY1979, 1982, 1985



*Summarized by requested start date or fiscal year of funds. Excludes applications with age and/or sex unknown.
Source: NIH, DRG, Statistics and Analysis Branch

8706-W29

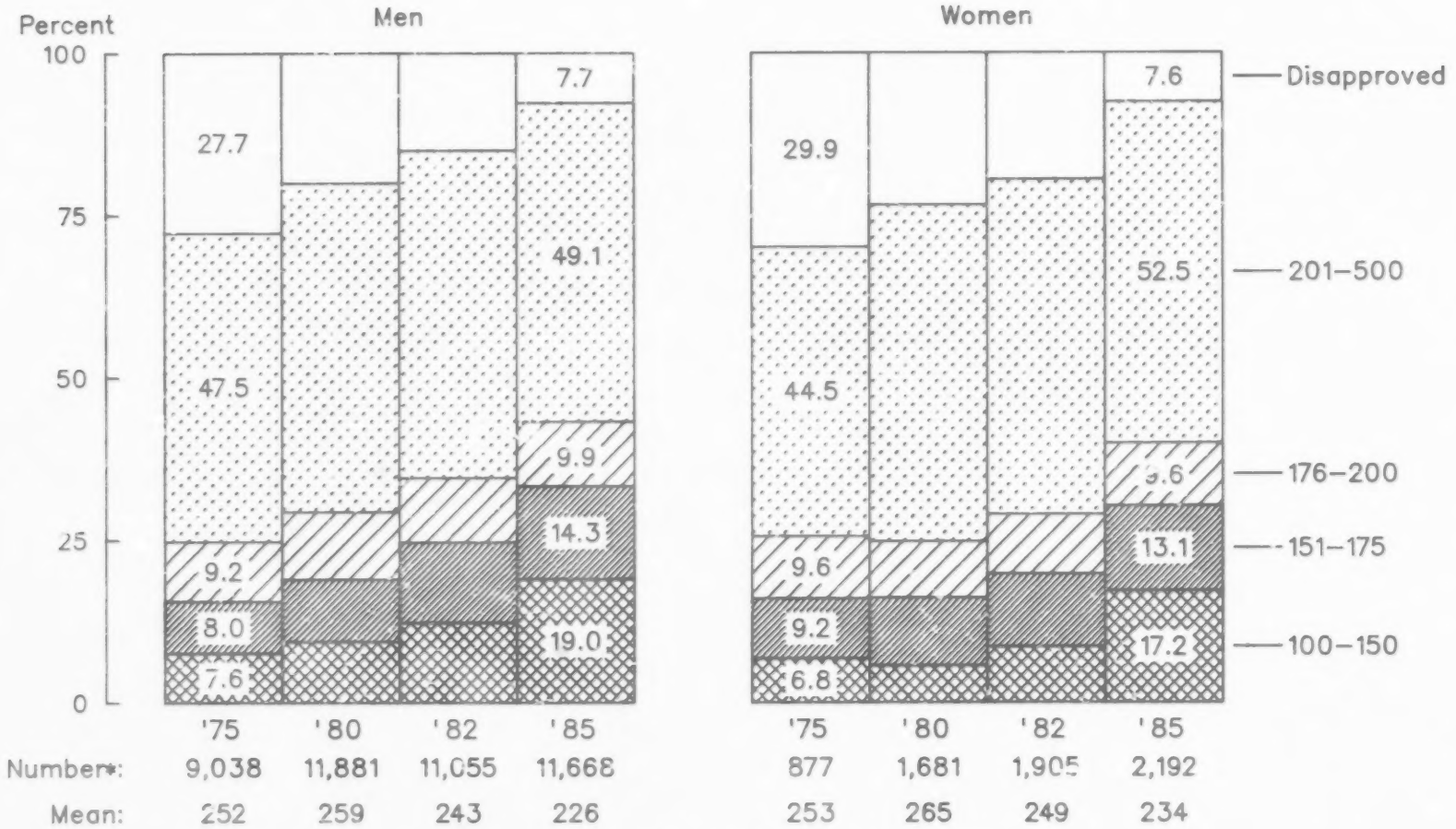
The decline in the proportion of R01 applications submitted by younger investigators (26-35) is found in both sexes. Among men, the proportion declined from 25.3 in 1979 to 17.5 in 1985 -- down 7.8 percentage points. Applications from younger women showed a higher but also declining proportion, 32.0 percent in 1979 down by 9.0 percentage points to 23.0 in 1985.

	Men		Women	
	Number*	% 35 or less	Number*	% 35 or less
1979	11,683	25.3	1,595	32.0
1980	11,497	24.2	1,618	34.2
1981	11,383	22.2	1,686	31.0
1982	11,548	21.8	1,862	30.0
1983	9,556	20.6	1,691	25.8
1984	10,617	18.9	1,930	26.6
1985	11,539	17.5	2,089	23.0
1979-85		-7.8		-9.0

*Applications with both age and sex recorded.

There was growth in applications submitted by the 41-45 age group for both men and women. However, unlike men, women showed a drop in the proportion of applications submitted by the over 50 age group -- 18.8 percent in 1979 down to only 14.3 percent in 1985, compared to 18.2 and 20.5 percent respectively for men.

DRG Study Section Action on Competing R01 Applications* by Sex** of Applicant, FY1975–1985 (selected years)



*Includes original and amended applications summarized by fiscal year of IRG review.
**Based on applications with response to sex: 100% in 1975 & 1980; 83% in 1982; 84% in 1985.
Source: NIH, DRG, Statistics and Analysis Branch

6706–W28

BEST COPY AVAILABLE

The proportion of R01 applications recommended for approval as well as the proportion in the potentially fundable range increased for women applicants in much the same way as for men. From 1975 to 1985, applications from women that were disapproved declined by 22 points from 30 to 8 percent, and by 20 points from 28 to 8 percent for men. At the same time, those with the best scores (100-175) increased by 14 percentage points from 16 to 30 percent for women and by 18 points from 16 to 33 percent of applications from men. Although a smaller proportion of women's applications receive scores of 175 or better, the data below suggest very competitive submissions from women, especially on new applications.

The percent of reviewed applications with scores 175 or better*:

	Total		New		Renewal	
	Men	Women	Men	Women	Men	Women
1975	15.6	16.1	11.6	13.7	26.9	24.1
1979	16.4	14.8	12.2	12.5	28.6	24.0
1980	19.0	16.1	12.3	13.3	31.3	25.9
1981	20.0	18.1	13.9	13.1	32.5	29.8
1982	22.8	19.8	17.0	15.0	37.5	35.5
1983	26.9	25.6	21.1	21.8	42.1	38.3
1984	30.4	26.9	22.6	20.2	48.3	47.4
1985	33.3	30.4	25.1	24.1	53.2	48.4
1986	37.4	35.6	28.2	27.7	54.9	52.4

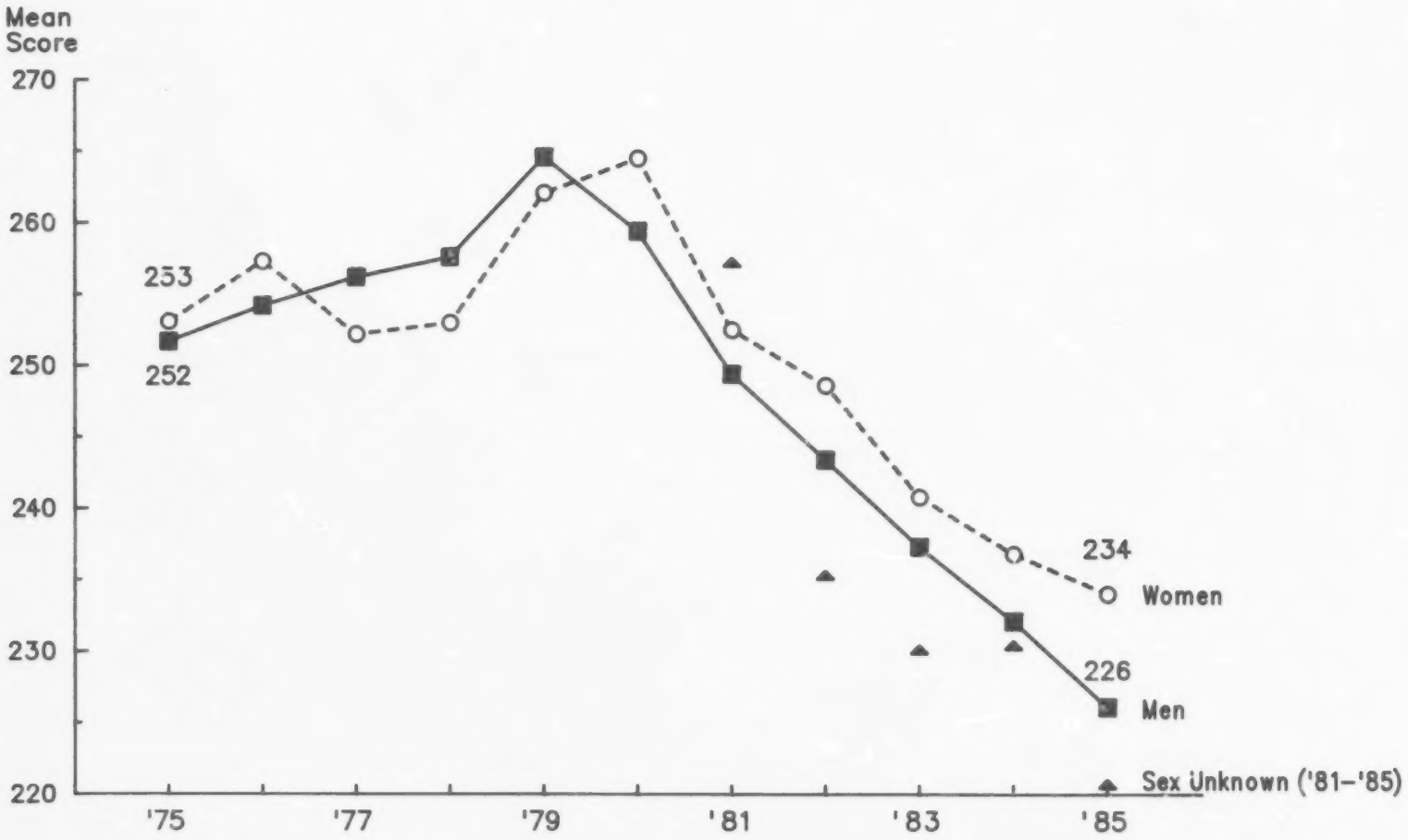
*Original and amended applications summarized by FY of IRG review.

Women applicants have a much lower percent of MD (or joint MD/PhD) degrees -- 12.7 vs. 27.4 percent for men in 1985. Regardless of applicant degree, men average better scores and success rates than women; both have better scores and success rates if they have PhD's.

	Applications		Mean Scores		Success Rates	
	Men	Women	Men	Women	Men	Women
MD*	27.4	12.7	232	238	31.1	25.1
PhD	70.1	84.7	226	233	33.1	29.7
Other or NA	2.5	2.6				

*Includes joint MD/PhD; summarized by FY of funds or requested start date from award rate file.

Mean Priority Scores of Competing R01 Applications by Sex of Applicant, FY 1975–1985*



*Includes original and amended applications summarized by fical year of IRG review.
Excludes withdrawals and supplements.
Source: NIH, DRG, Statistics and Analysis Branch

8706–W8

Since 1980, women averaged slightly poorer scores than men on R01 applications. Their score differences ranged from 3 to 8 points with similar trends in both new and competing renewals.

	Total		New		Renewal	
	Men	Women	Men	Women	Men	Women
1975	252	253	264	265	225	224
1977	256	252	271	263	228	228
1979	265	262	279	272	232	231
1981	249	253	266	270	221	221
1982	243	249	257	260	214	219
1983	237	241	250	252	208	208
1984	232	237	248	250	200	202
1985	226	234	241	248	193	198
1986	218	221	235	237	188	188

Summarized by fiscal year of IRG review.

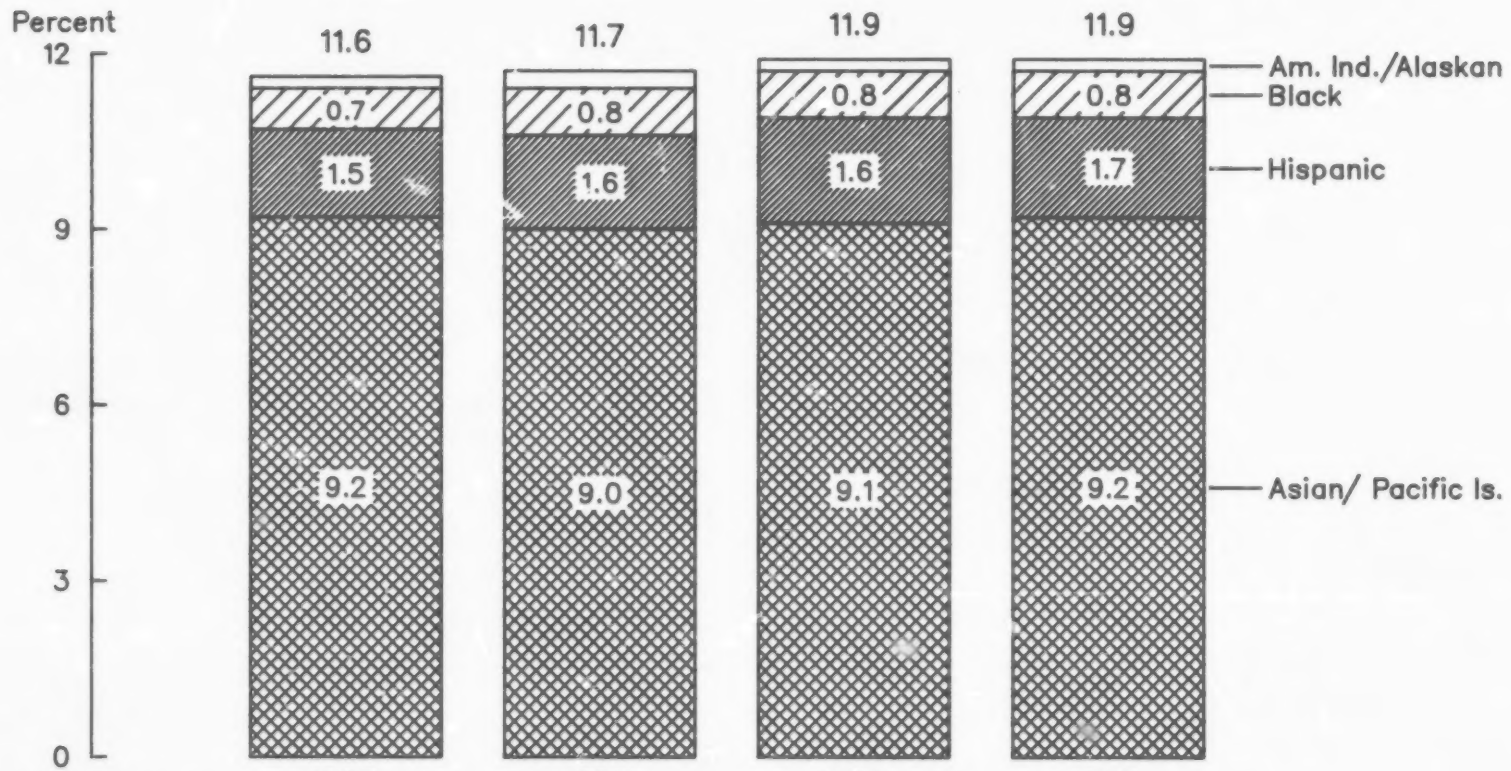
In 1985, the largest portion of women's R01 applications were reviewed by Behavioral/Neurological Review Sections (26.5%), or Biological Sections (23.3%) -- the fewest by Clinical Science (14.4%) and Biomedical Sections (12.7%). Conversely, the smallest share of men's applications were reviewed at Behavioral/Neurosciences Sections (16.4%) with all other sections (except Special) reviewing about 19 - 20 percent. A similar distribution was found in 1984.

Women averaged scores equal to or better than men on applications reviewed by three sections -- Biological, Biomedical and Physiological Review but scores poorer than mens' in Behavioral/Neurosciences, Clinical and Special Review Sections. Success rates for women were poorer than men in all review sections. The distribution of 1985 reviewed applications, mean scores and success rates are as follows*:

	Applications		Mean Scores		Success Rates	
Review Section	Men	Women	Men	Women	Men	Women
Behav./Neuroscience	16.4	26.5	238	257	30.4	24.0
Biological Science	19.3	23.3	221	221	33.0	31.7
Physiological Science	18.5	17.2	229	226	30.1	29.7
Clinical Science	18.6	14.4	239	244	30.0	26.9
Biomedical Science	20.3	12.7	216	216	38.2	34.8
Special Sections	7.0	6.0	229	238	30.9	27.1
Total	100.0	100.0				

*From award rate file by FY year of funds or requested start date. Success rate equals awards as a percent of number reviewed.

Minority Representation Among Competing R01 Applications* Reviewed by DRG Study Sections, FY 1982–1985



*Summarized by requested start date or fiscal year of funds from award rate file.
Encrypted data captured since May 1981. Number with response shown.
Source: NIH, DRG, Statistics and Analysis Branch

8706-W45

The race/ethnic origin of research grant applicants has been captured in the IMPAC data system in encrypted form since May 1981. This information is provided on a voluntary basis and is separated from the grant application prior to review. Response to this item has been 79-80 percent since 1982 except 1983 when, due to a data processing error, racial information for only 72 percent of applications was recorded. Despite the 20 percent non-response to this item, data are included since it is the only available indication of the number and priority scores of applications submitted for DRG review by minorities. Unless response to this item improves, data on race will remain an approximation.

The proportion of R01 applications from racial/ethnic minorities has remained almost constant, increasing by only 0.3 percentage points from 11.6 to 11.9 percent of total applications in the 1982 - 1985 fiscal years. The proportion among the four minority groups has also remained relatively unchanged. Applicants of Asian/Pacific Island origin consistently submit more than three times as many applications as all other minority groups combined -- 9.2 percent of total R01 applications (reporting race) in both 1982 and 1985.

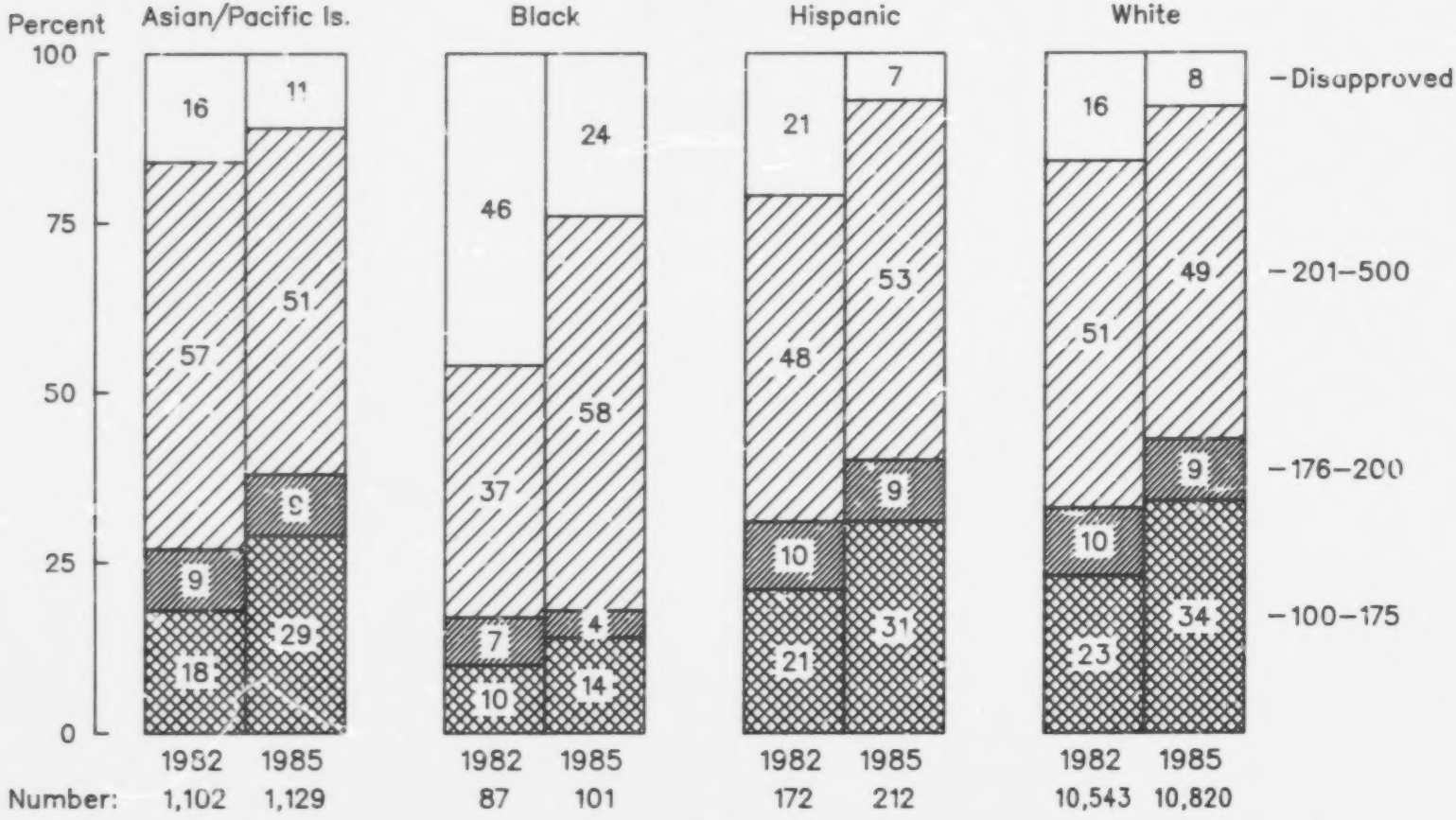
The next largest group, applicants of Hispanic origin, submitted 1.5 percent of R01 applications in 1982 and 1.7 in 1985. The proportion submitted by Black applicants remains under 1 percent; those of American Indian/Alaskan origin are the smallest with 0.2 percent.

The proportion of applications submitted by the various minority groups is inconsistent with expectations if related to the 1984 enrollment in Graduate and Professional Schools. In contrast to their large share of R01 applications, the 1984 enrollment of Asian/Pacific Islanders in Graduate and Professional schools was less than Blacks and only slightly more than Hispanics according to statistics published by the U.S Dept. of Education (NCES).

	1984 Enrollment				R01 Applications	
	Number		Percent		Percent	
	Grad. School	Prof. School	Grad. School	Prof. School	1984	1985
Am. Ind./Alaskan	3,634	960	0.3	0.4	0.2	0.2
Black	52,834	13,243	4.9	4.8	0.8	0.8
Hispanic	24,402	7,913	2.3	2.9	1.7	1.7
Asian/Pac. Is.	28,543	9,240	2.6	3.3	9.1	9.2
White	862,253	241,597	80.0	87.4	88.1	88.1
Foreign	106,667	3,391	9.9	1.2	-	-
	1,078,333	276,344	100.0	100.0	100.0	100.0

BLANK PAGE

DRG Study Section Action on Competing R01 Applications By Race/Ethnic Origin of Investigator*, FY 1982 and 1985**



*With response to race/ethnic origin (79–80% response),
**Summarized by requested start date or fiscal year of funds from award rate file.
Source: NIH, DRG, Statistics and Analysis Branch

8706-W46

Since racial data first became available in 1982, all groups showed an increase in the proportion of their applications that were approved and an increase in the proportion in the 100-175 priority score range. However, there were clear differences among the racial groups, with Blacks showing the greatest improvement in approval rates but Asian/Pacific Islanders and Hispanics showing larger increases in the proportion with fundable scores.

In 1985, disapproved R01 applications ranged from 7 percent for Hispanic to 24 percent for Black applicants. The proportion of reviewed applications from minorities with scores between 100-175 ranged from 31 percent for Hispanics and 29 percent for Asian/Pacific Islanders to 14 percent for Blacks. These distributions are based on the very small numbers of applications recorded from Black and Hispanic applicants -- only 101 and 212 respectively in 1985. Applications for other NIH grant activities designed to increase the involvement of minorities in biomedical research are assigned to institute review panels. Examples include Minority Biomedical Research Support (S06, S11, S14), Research Centers in Minority Institutions (G12), MARC Awards (T34, 36 and F34, 36), and Faculty Development Awards (K14).

	Percent Disapproved*				Percent 100 - 175*			
	1982	1983	1984	1985	1982	1983	1984	1985
Asian/Pac. Is.	16	14	13	11	18	23	23	29
Black	46	29	29	24	10	17	14	14
Hispanic	21	18	12	7	21	24	26	31
White	16	12	11	8	23	28	30	34

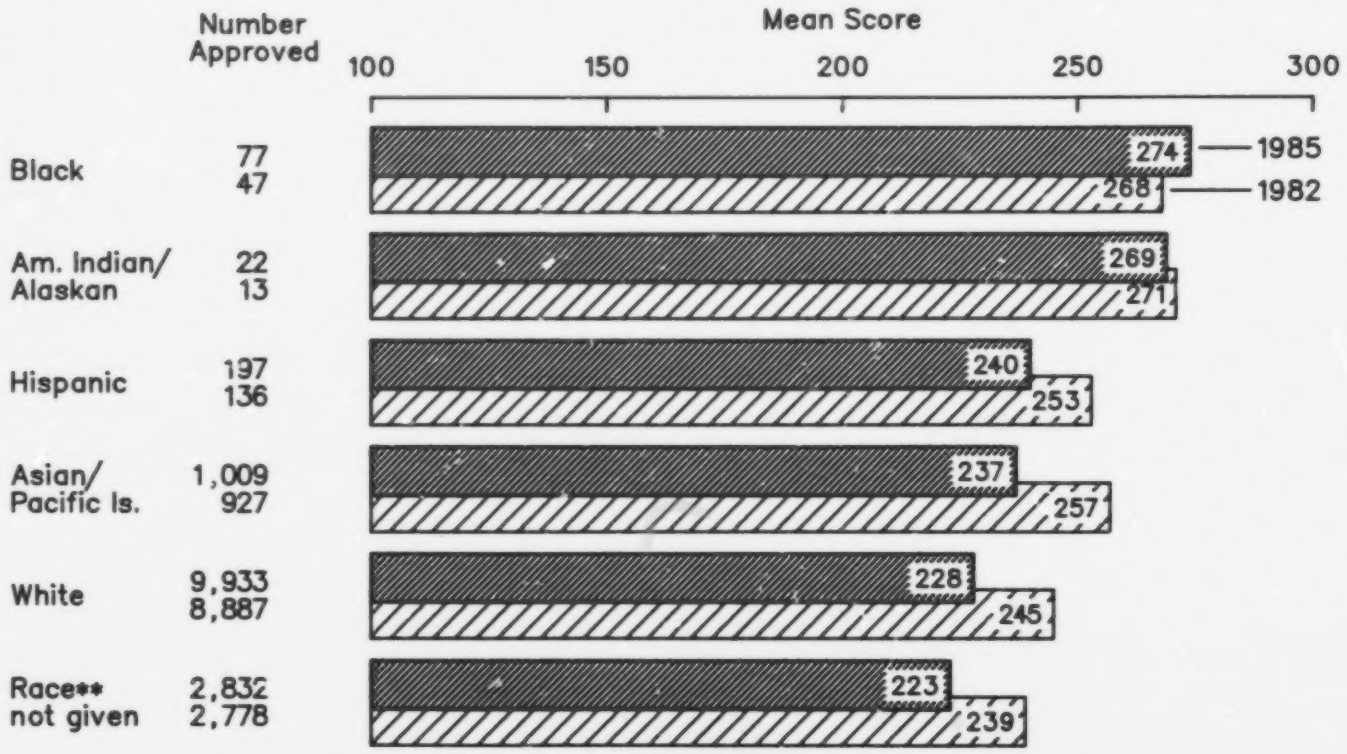
*Percent of reviewed applications summarized by FY of funds or requested start date from award rate file.

Minority applicants show substantially different degree profiles. Applicants of Hispanic origin clearly have the highest proportion of MD's -- frequently over 40 percent and double those of other minorities. Conversely, applicants of Asian/Pacific Island origin report the highest proportion with PhDs -- between 75 and 80 percent. Other degrees are not shown. MDs include joint MD/PhD.*

	Asian/ Pacific Is.		Black		Hispanic		White	
	MD*	PhD	MD*	PhD	MD*	PhD	MD*	PhD
1982	16.2	80.7	20.7	71.3	41.9	54.1	28.2	67.8
1983	20.4	75.8	21.2	67.1	43.3	53.0	27.9	67.8
1984	19.1	78.4	20.0	71.1	46.8	51.7	27.8	69.0
1985	16.7	80.3	23.8	72.3	37.3	60.4	25.7	71.9

Because the non-response to race possibly contains some bias, the use of prorated numbers has been avoided.

Mean Priority Scores of Competing R01 Applications* by Race/Ethnic Origin** of Principal Investigator, FY 1982 and 1985



*Summarized by requested start date or fiscal year of funds. **Encrypted data captured since May 1981. Response rate of 79% in 1982 and 80% in 1985.
Source: NIH, DRG, Statistics and Analysis Branch

8706-W44

The mean scores of approved R01 applications submitted by racial/ethnic minorities summarize relationships previously seen in their score distributions (page 84). Hispanic and Asian/Pacific Islanders have similar mean scores as do Blacks and American Indian/Alaskan applicants.*

	1982			1985		
	Total	New	Renewal	Total	New	Renewal
Am. Ind./Alaskan	271	271	**	269	295	**
Asian/Pacific Is.	257	270	222	237	253	195
Black	268	276	247	274	279	251
Hispanic	253	266	220	240	262	186
White	245	260	213	228	244	193

*By requested start date or FY of funds from award rate file.
**Less than 15 application.

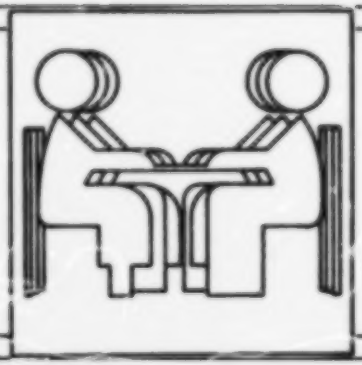
Although numerous factors contribute to the differences in scores, the small number of applications from all minority groups except Asian/Pacific Islanders, coupled with the nonresponse, hinder any conclusive analysis. Nevertheless, it is worth noting that applications from Blacks frequently fall into categories that are noted for poorer scores. For example, applications requesting 1 or 2 years of support have averaged substantially poorer scores than applications requesting longer terms of support (page 46). In 1985, 15 percent of applications from Blacks requested 1-2 years, substantially more than the 4 percent among Asian/Pacific Islanders and 7 percent for Hispanics and Whites. A similar pattern was found in 1984 applications.

The following success rates* are based on reviewed applications recorded in the award rate file and generally agree with the trends suggested by the mean scores.

	1982			1985		
	Total	New	Renewal	Total	New	Renewal
Am. Ind./Alaskan	22.2	22.2	**	24.0	14.3	**
Asian/Pacific Is.	23.3	15.8	47.2	28.0	19.1	53.0
Black	16.1	14.1	25.0	13.9	12.0	22.2
Hispanic	28.3	22.4	48.7	30.0	19.5	57.6
White	28.4	20.9	47.6	32.2	23.5	52.8

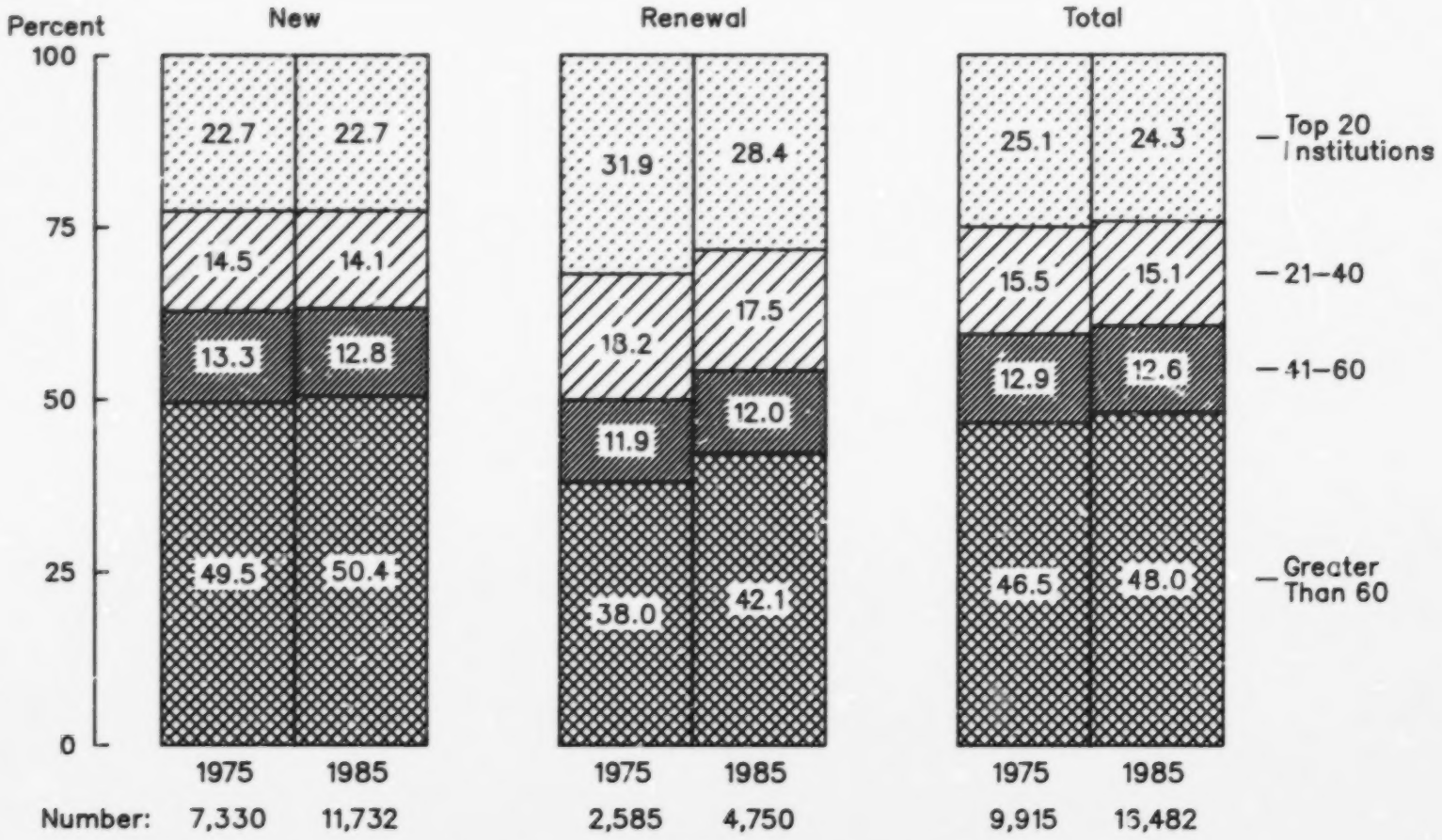
*Awards as a percent of number reviewed.

BLANK PAGE



5. APPLICANT INSTITUTION RELATED TO STUDY SECTION ACTION
   - Rank of institution (top 20 etc.)
     - Distribution of applications
     - Study section actions: disapprovals, score distribution
   - Type institution related to mean priority scores
   - Basic vs. Clinical departments (higher education)
     - Mean priority score trends
   - Department of applicant (higher education)
     - Mean priority score trends

Distribution of R01 Applications Reviewed by DRG Study Sections* by Rank of Institution**, FY 1975 & 1985



*Summarized by fiscal year of IRG review. Excludes withdrawals and supplements.
**Institution ranked by total R01 dollar support in indicated year.
Source: NIH, DRG, Statistics and Analysis Branch

8706-W39

About one-fourth of the R01 applications reviewed by DRG study sections in 1985 were from the top 20 grantee institutions (ranked by R01 dollar support). They submitted 4,000 applications or an average of 200 per institution. The second 20 institutions submitted 15.1 percent -- 2,500 applications or 125 per institution. The top 20 institutions submit from 50 to 60 percent more applications than the next 20.

The top 40 institutions submit a large share of competing renewals -- 46 percent vs. only 37 percent of new applications in 1985. However, their share of renewals has dropped slightly since 1975 (from 50 to 46 percent) with a corresponding increase in renewals from institutions ranked above 60 (from 38 to 42 percent).

Although the proportion of applications from the top institutions remained relatively stable since 1975, both the total number (and average per institution) increased as follows:

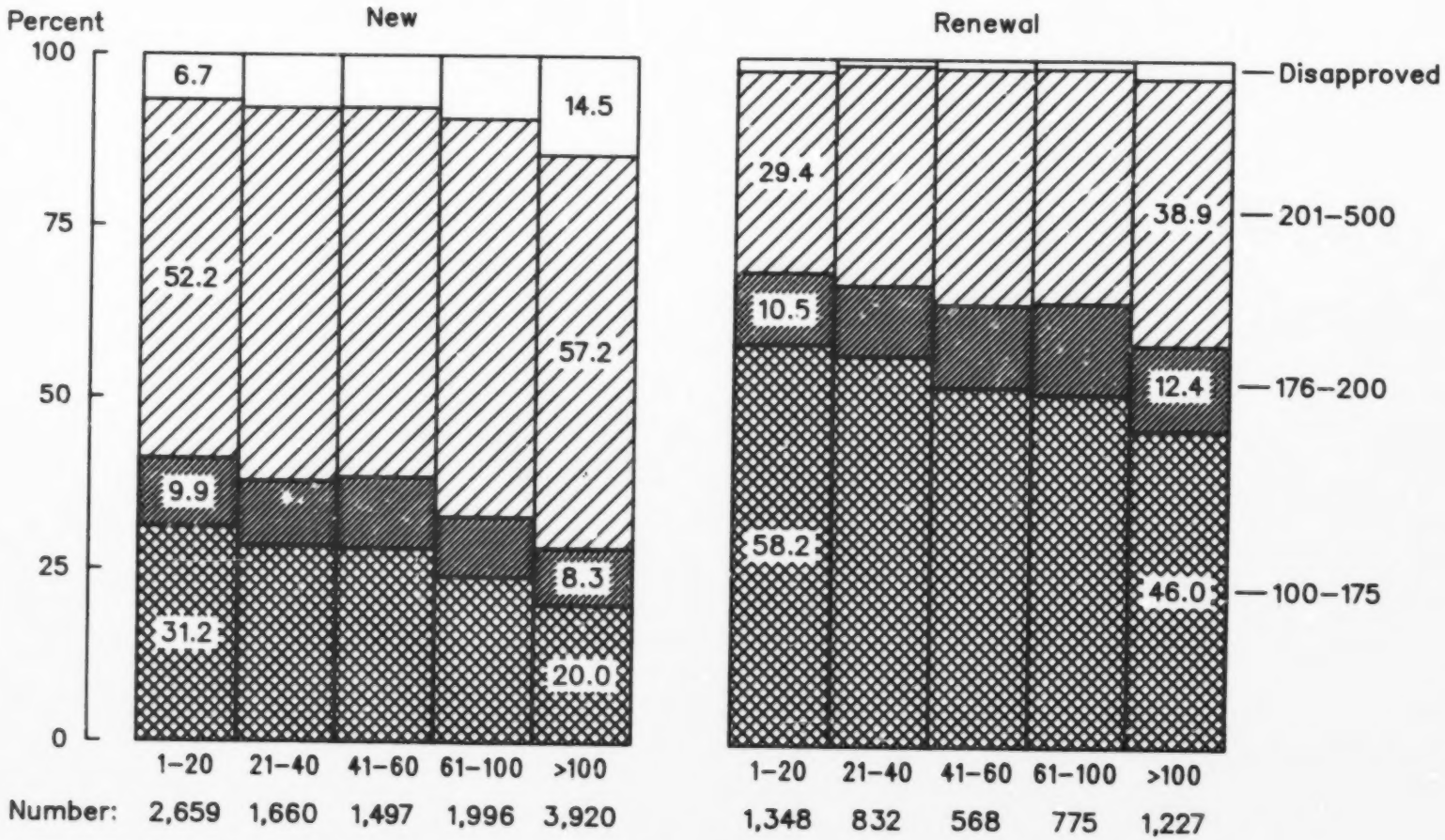
Institution Rank	1975		1980		1985		Increase 1975-1985	
	No.	Avg*	No.	Avg*	No.	Avg*	No.	Avg*
1-20	2,489	124	3,234	162	4,007	200	1,518	76
21-40	1,537	77	2,126	106	2,492	125	955	48
41-60	1,281	64	1,668	83	2,065	103	784	39
61-100	1,498	37	2,260	57	2,771	69	1,273	32
over 100	3,110		4,321		5,147		2,037	

By fiscal year IRG review. *Average per institution.

Some of the increase since 1975 is due to amended applications. The average number of original vs. amended R01 applications per institution is as follows:

Institution Rank	Non-amendments			Amendments		
	1975	1985	75-85	1975	1985	75-85
1-20	109	155	46	15	45	30
21-40	66	95	29	11	29	18
41-60	54	77	23	10	26	16
61-100	32	51	19	5	18	13

DRG Study Section Action on Competing R01 Applications*
By Rank** of Applicant Institution, FY 1985



*Original and amended applications summarized by fiscal year of IRG review;
**Institution ranked by total R01 dollar support in FY 1985,
Source: NIH, DRG, Statistics and Analysis Branch

8706-W42

BEST COPY AVAILABLE

In addition to an increased number of submissions, the top ranked institutions submit applications that fare better in study section review. In 1985, 31.2 percent of new applications from the top 20 institutions received scores of 100-175 vs. only 20.0 percent from institutions ranked over 100. Corresponding figures for 1985 competing renewals were 58.2 vs. 46.0 percent with scores 100-175. All groups showed score improvement since 1979-80; the top ranked institutions showed greater improvement than other institutions on new applications.

Percent with Scores 100-175

Institution Rank*	New Applications			Competing Renewals		
	1980	1985	Diff. 80-85	1980	1985	Diff. 80-85
1-20	17.2	31.2	+14.0	37.0	58.2	+21.2
21-40	13.6	28.5	+14.9	34.3	56.6	+22.3
41-60	14.3	28.1	+13.8	29.7	52.1	+22.4
61-100	11.5	24.0	+12.5	27.8	51.2	+23.4
over 100	8.9	20.0	+11.1	23.3	46.0	+22.7
Total	12.5	25.5	+13.0	30.7	52.9	+22.2

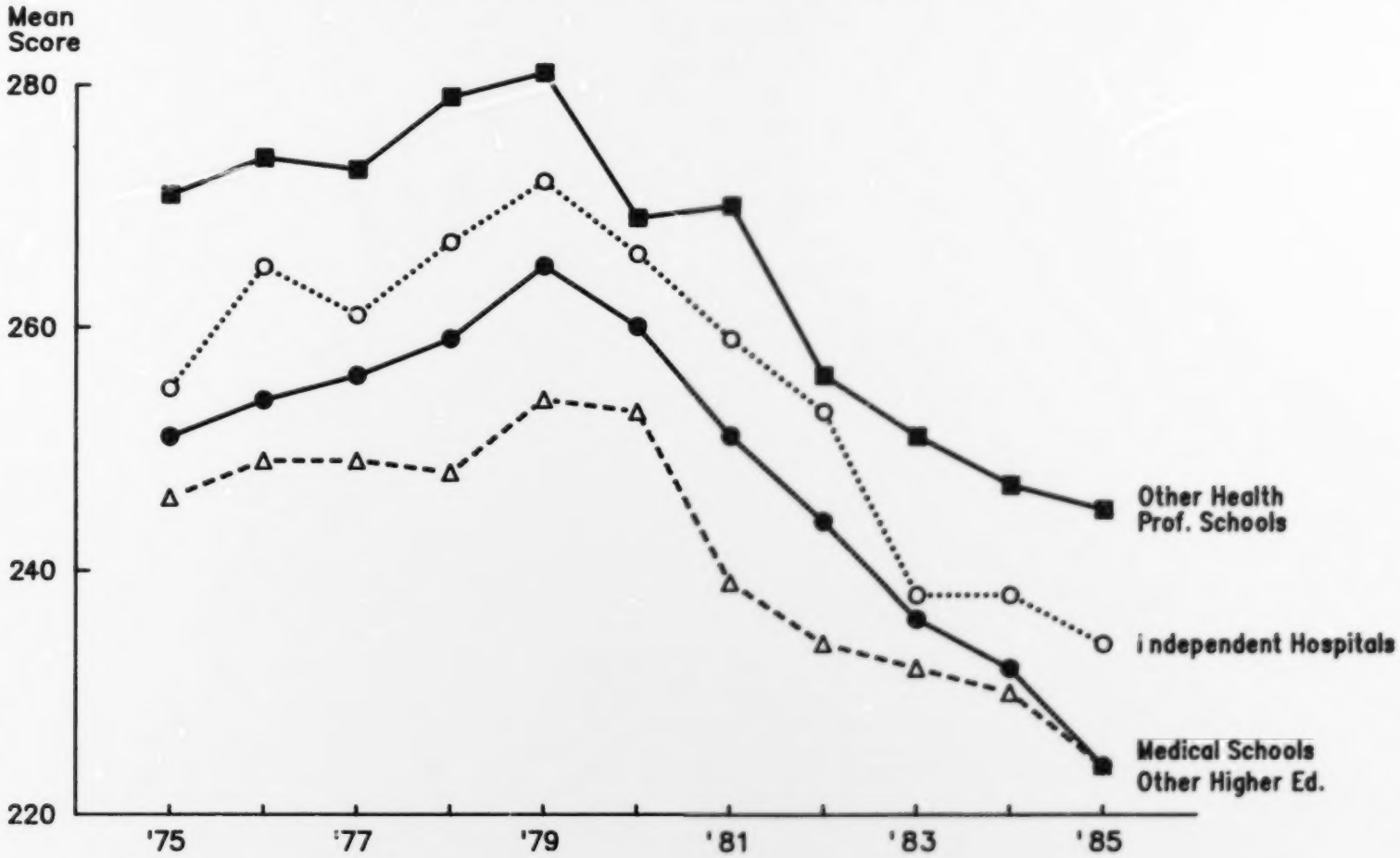
*Ranked by total R01 dollar support.
Reviewed applications by fiscal year of IRG review.

The top ranked institutions had the lowest proportion of disapproved applications, however all showed a drop in disapproval rates.

Percent Disapproved

Institution Rank*	New Applications			Competing Renewals		
	1980	1985	Diff. 80-85	1980	1985	Diff. 80-85
1-20	20.4	6.7	-13.7	6.2	1.9	-4.3
21-40	21.3	7.8	-13.5	4.6	1.0	-4.6
41-60	23.2	7.7	-15.5	7.6	1.4	-6.2
61-100	25.9	9.3	-16.6	6.2	1.3	-4.9
over 100	29.9	14.5	-15.4	8.2	2.7	-5.5
Total	25.0	10.0	-15.0	6.6	1.8	-4.8

Mean Priority Scores of DRG Approved R01 Applications by Type of Applicant Institution, FY1975–1985*



*Includes original and amended applications summarized by fiscal year of IRG review.
Excludes withdrawals and supplements.
Source: NIH, DRG, Statistics and Analysis Branch

8706–W19

Medical schools and "other higher education" (excluding other health professional schools) submitted by far the largest share of R01 applications -- 52 and 24 percent respectively in 1985. Applications from all types of institutions showed score improvement since 1979 with the largest change (49 points) in research and other nonprofit institutions, followed by medical schools (41 points).

R01 applications from medical schools, "other institutions of higher education" and research/ other nonprofit organizations consistently averaged better scores than applications submitted by other health professional schools, independent hospitals or for-profit organizations. Differences between the best vs. poorest average scores ranged from 27 points in 1979 to 21 points in 1985. Applications from research and other nonprofit institutions (not shown) had an erratic trend that fell between medical schools and independent hospitals. For-profit organizations, with less than 50 R01 applications each year, showed extremely variable score distributions and success rates.

	Reviewed Applications*			Mean Scores			
	1975	1979	1985	1975	1979	1985	1979-85
Medical Schools	4,648	7,064	8,560	251	265	224	-41
Other Health Prof.	728	1,063	1,254	271	281	245	-36
Other Higher Education	2,915	3,795	4,003	246	254	224	-30
Independent Hospitals	776	1,021	1,166	257	273	235	-38
Res. & Other Nonprofit	816	1,323	1,458	255	271	222	-49
Profit Organizations	17	22	44	217	256	252	-4
Total	9,900	14,288	16,485	252	264	226	-38

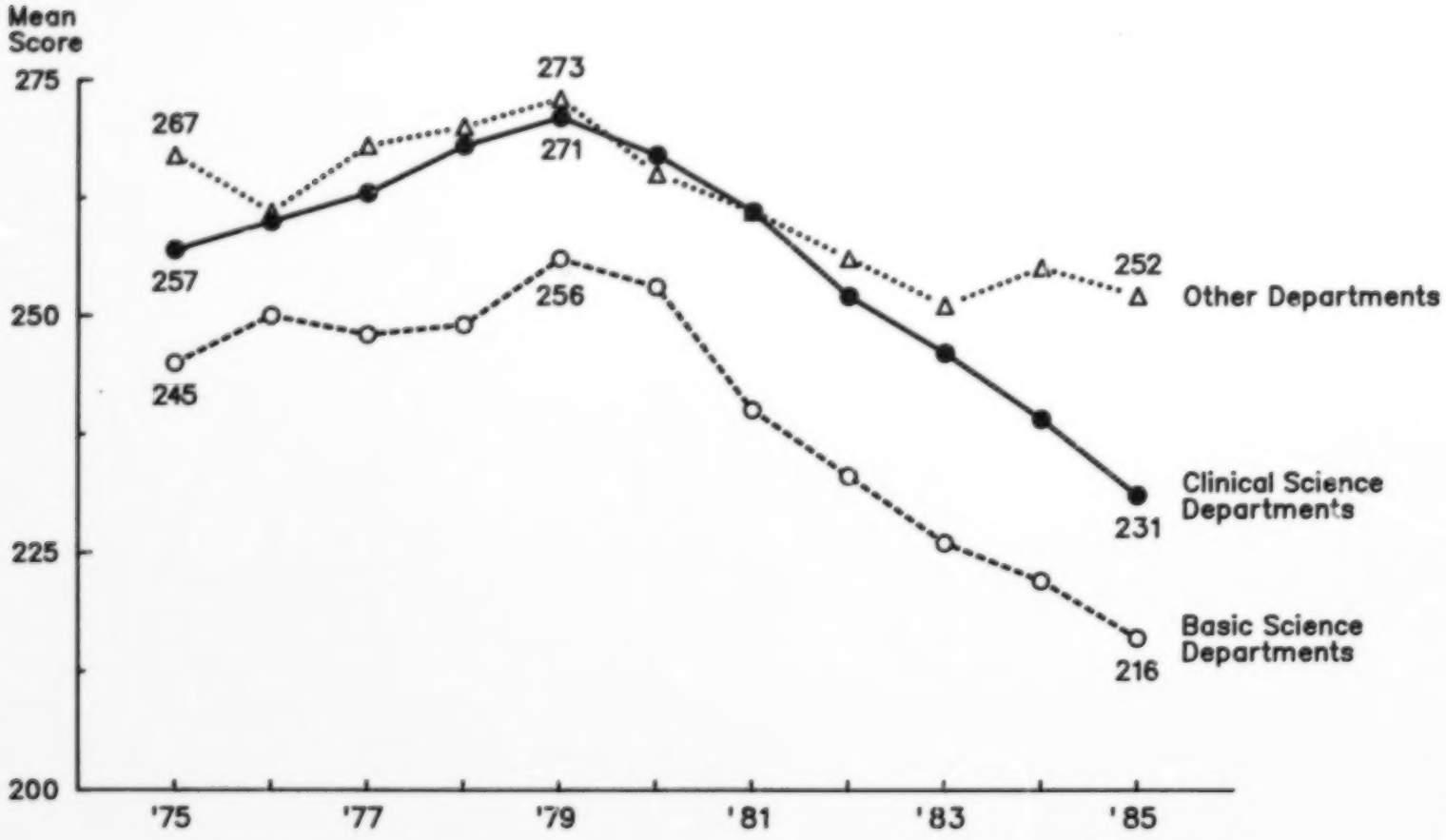
*Summarized by fiscal year of IRG review.

Priority ratings are one of several factors which influence the success of applications in obtaining funding. The following success rates* are compiled from the award rate file which deletes the original application if an amendment is reviewed in the same fiscal year.

	1975	1979	1985
Medical Schools	45.4	41.0	32.2
Other Health Prof.	38.9	28.4	26.7
Other Higher Education	47.1	41.7	34.4
Independent Hospitals	38.1	36.8	30.2
Res. & Other Nonprofit	41.8	36.3	34.2
Profit Organizations	42.9	6.7	37.8
Total	44.4	39.5	32.4

*Summarized by fiscal year of funds or requested start date.

Mean Priority Scores of Competing R01 Applications From Basic vs. Clinical Departments*, FY 1975–1985**



*Institutions of higher education only (domestic). **Original and amended applications summarized by fiscal year of IRG review. Excludes withdrawals and supplements.
Source: NIH, DRG, Statistics and Analysis Branch

8706-W43

Since 1975, slightly more than half (52 to 55 percent) of the R01 applications from institutions of higher education have been from basic science departments. An additional 29 to 32 percent were from clinical science departments, leaving 15 to 17 percent from all other departments. (See technical notes for inclusions)

Applications from basic science departments average scores that are about 15 to 20 points better than those from clinical departments. Clinical and "other" departments had similar scores until 1982. A gap then developed when applications from "other" departments failed to show as much score improvement.

	Number Reviewed*			Mean Scores		
	Basic	Clinical	Other	Basic	Clinical	Other
1975	4,434	2,339	1,414	245	257	267
1977	5,815	3,141	1,615	248	263	268
1979	6,179	3,605	1,939	256	271	273
1981	6,706	3,803	1,837	240	261	261
1983	6,452	3,959	1,868	226	246	251
1984	6,727	4,179	1,952	222	239	255
1985	7,181	4,389	1,993	216	231	252
1975-85	2,747	2,050	579	-29	-26	-15

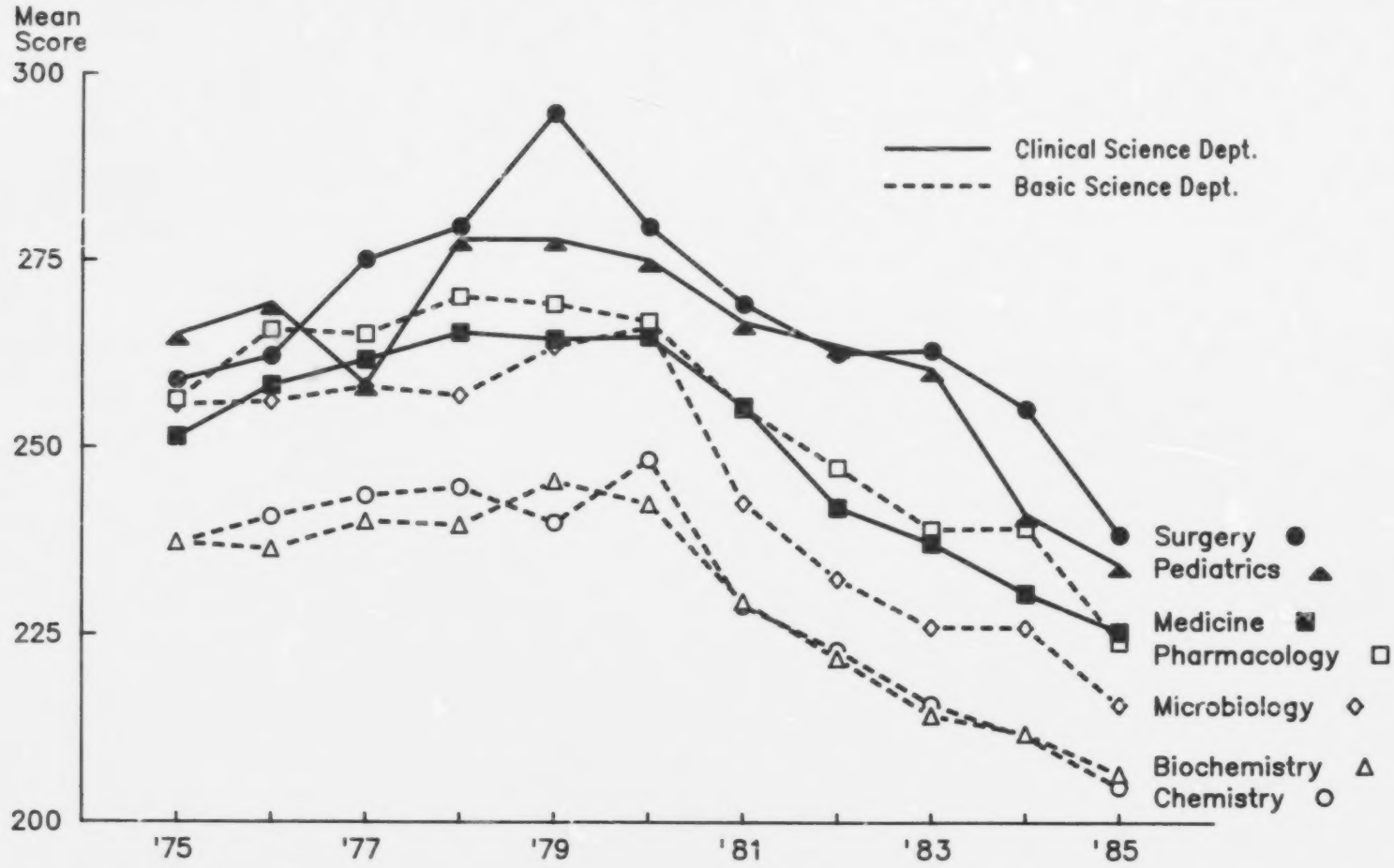
*From institutions of higher education; by FY of IRG review.

The proportion of applications from basic vs. clinical or other departments varies by type of institution. The best scores are found on applications from basic science departments in each of the three institution groups.

	Number Reviewed			Mean Scores		
	Basic	Clinical	Other	Basic	Clinical	Other
Medical Schools						
1983	3,778	3,713	121	227	246	235
1984	4,039	3,969	133	225	238	246
1985	4,294	4,124	144	218	231	245
Other Health Prof.						
1983	437	210	491	248	251	255
1984	422	177	526	237	257	252
1985	425	232	597	240	237	252
Other Higher Ed.						
1983	2,237	*	1,256	222	*	251
1984	2,266	*	1,293	215	*	257
1985	2,462	*	1,252	209	*	253

*Less than 50 applications.

Mean Priority Scores of Competing R01 Applications* by Department** of Principal Investigator, FY 1975–1985 (selected departments)



*Original and amended applications summarized by fiscal year of IRG review. Excludes withdrawals and supplements. **Institutions of higher education only (domestic).
Source: NIH, DRG, Statistics and Analysis Branch

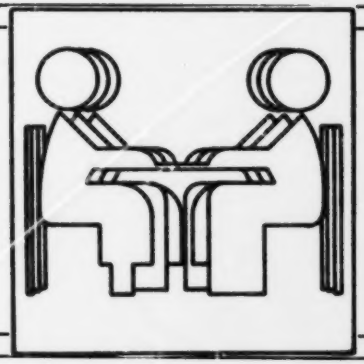
8706–W47

Considerable score variation exists among the departments that are grouped in the broad categories of basic/clinical sciences. However, aside from some expected overlap, applications from specific basic science departments average better scores than clinical science or other departments. Applications from departments of chemistry and biochemistry (basic science) averaged the best and remarkably similar scores throughout the past decade. Clinical departments such as medicine, ophthalmology, neurology or radiology show mean scores which overlap the higher score range of basic science departments while those from surgery, pediatrics and psychiatry average poorer scores.

Department (Higher Ed.)	Number Reviewed*		Mean Score	
	1979	1985	1979	1985
Basic Science	6,179	7,181	256	216
Chemistry	801	839	240	205
Biochemistry	1,109	1,205	245	207
Zoology	139	159	245	209
Genetics	119	157	243	213
Biology	765	941	260	216
Microbiology	717	779	263	216
Physiology	689	700	259	220
Anatomy	484	680	270	223
Pharmacology	651	789	269	224
Pathology	476	625	268	231
Clinical Science	3,605	4,389	271	231
Ophthalmology	135	191	263	218
Medicine	1,440	1,749	264	225
Neurology	174	262	258	226
Radiology	252	293	276	226
Pediatrics	410	478	278	234
Surgery	470	479	295	238
Pub. Health & Prev.	198	258	268	239
Psychiatry	116	140	287	244
Ob.-Gynecology	193	249	270	248
Other Departments	1,939	1,993	273	252
Engineering (all)	237	178	278	246
Veterinary Science	135	160	291	247
Other Health Prof.	166	169	278	249
Dentistry	148	164	260	251
Psychology	302	392	260	253
Nutrition	154	137	275	258
Miscellaneous	306	319	284	258

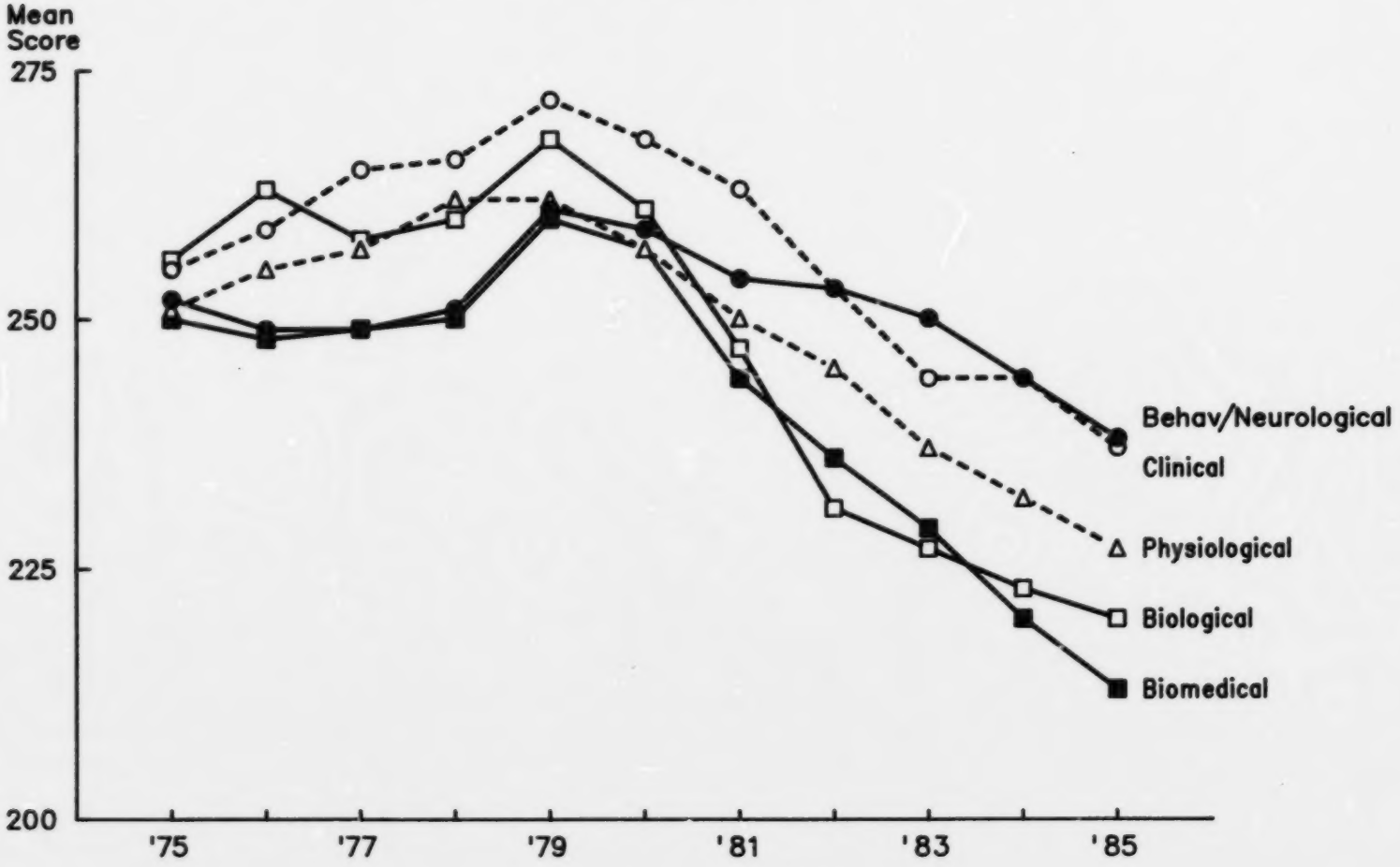
*Selected departments ranked by 1985 mean score; by FY of IRG review.

BLANK PAGE



6. DIFFERENCES AMONG STUDY SECTIONS
   - Mean priority score trends by Review Section
   - Difference in recommended approval rate
   - Difference in mean priority scores
   - Scattergram of 1980 vs. 1985 mean priority scores

Mean Priority Scores of Competing R01 Applications* by Review Section**, FY 1975–1985



*Original and amended applications summarized by fiscal year of IRG review. Excludes withdrawals and supplements. **1985 study section grouping.
Source: NIH, DRG, Statistics and Analysis Branch

8706–W41

DRG study sections are organized into five scientific review groups plus a special review section. These groups of study sections are determined primarily by subject matter or area of interest, with workload as a secondary consideration in cases of overlap. The level of scores in the different review sections is similar to score differences found in Basic vs. Clinical or Other departments (page 98).

Consistent with overall score trends, all review sections show an increase in both mean and median scores from 1975-1979, followed by a steady annual decline. The largest decline in mean scores (47-48 points since 1979) was in the Biological and Biomedical Review Sections, followed by Physiological and Clinical Sections (down 35 points). Behavioral/Neurosciences and Special Review Sections showed much less score improvement -- down only 23 and 14 points respectively. This primarily reflects differences in study section behavior on new applications; all review sections show similar score improvement on competing renewals.

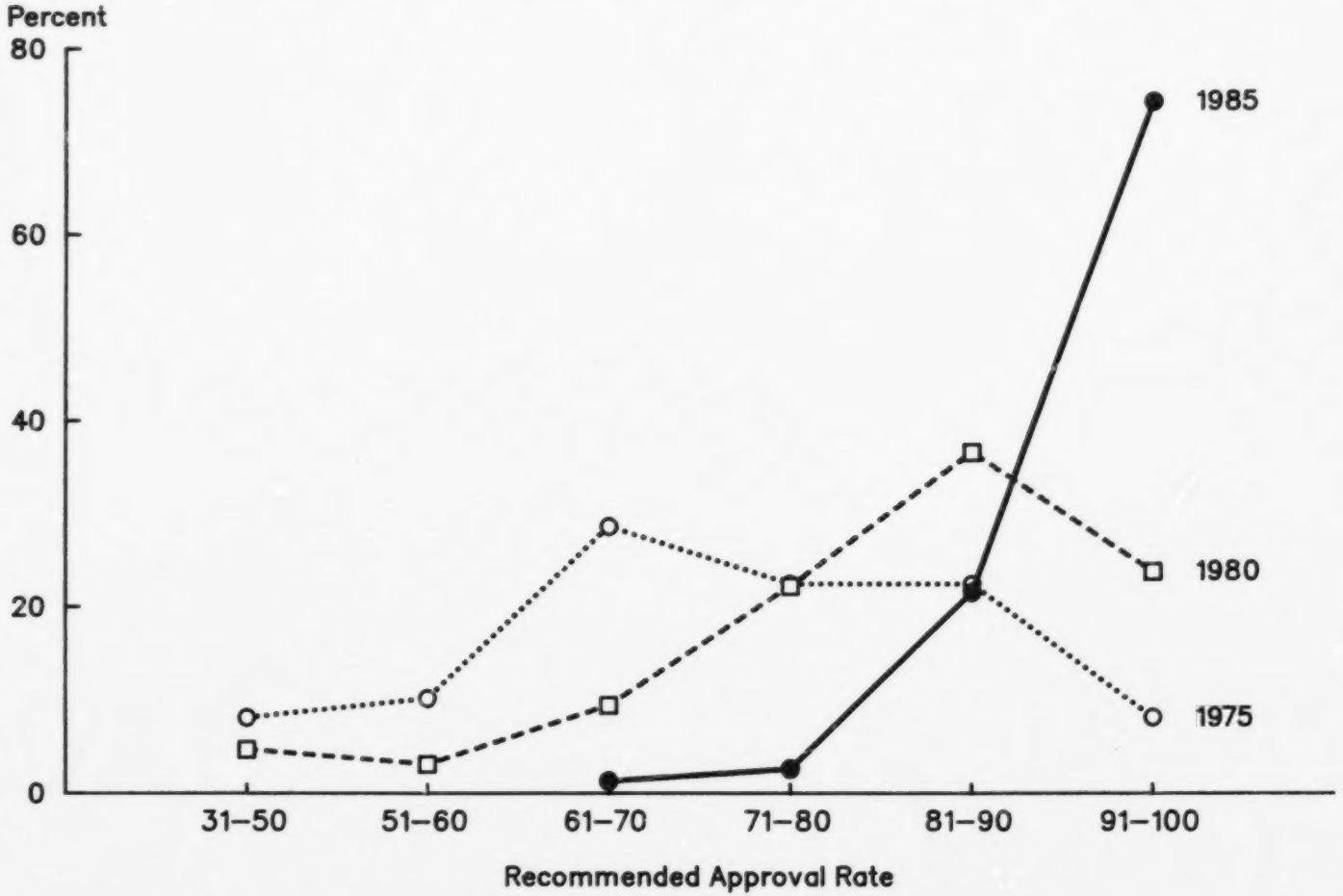
	Mean Scores				Recommended Approval Rates			
Review Section	1975	1979	1985	79-85	1975	1979	1985	79-85
Biomedical	250	260	213	-47	81.6	87.5	96.6	+9.1
Biological	256	268	220	-48	79.2	86.5	95.9	+9.4
Physiological	251	262	227	-35	69.7	77.7	92.1	+14.4
Clinical	255	272	237	-35	65.8	73.7	90.2	+16.5
Behav/Neur.	252	261	238	-23	59.4	58.0	88.7	+30.7
Special	234	241	227	-14	66.8	60.6	84.9	+24.3
Total	252	264	226	-38	72.1	77.6	92.3	+14.7

Each review section included study sections with a wide range of mean scores. In 1985, Biomedical Review was the most consistent with study section means ranging from 192 to 232 (40 point range). At the other extreme, means ranged from 196 to 315 (119 point range) in Behavioral/Neuroscience due to consistently high scores in sections reviewing behavioral applications.

Neurological	234	249	214	-35	68.6	70.7	92.8	+22.1
*Behavioral	275	275	273	-2	51.1	48.0	83.4	+35.4

*Includes BEM, BPO, EDC, HUD, SSP; By FY of IRG review.

Percent Distribution of DRG Study Sections by Recommended Approval Rate of R01 Applications*, FY1975, 1980, 1985



*Approval rates summarized by fiscal year of IRG review. Excludes special study sections; includes all other sections reviewing 100 or more R01 applications in indicated year: 49 in '75, 63 in '80, 74 in '85.
Source: NIH, DRG, Statistics and Analysis Branch

8706-W21

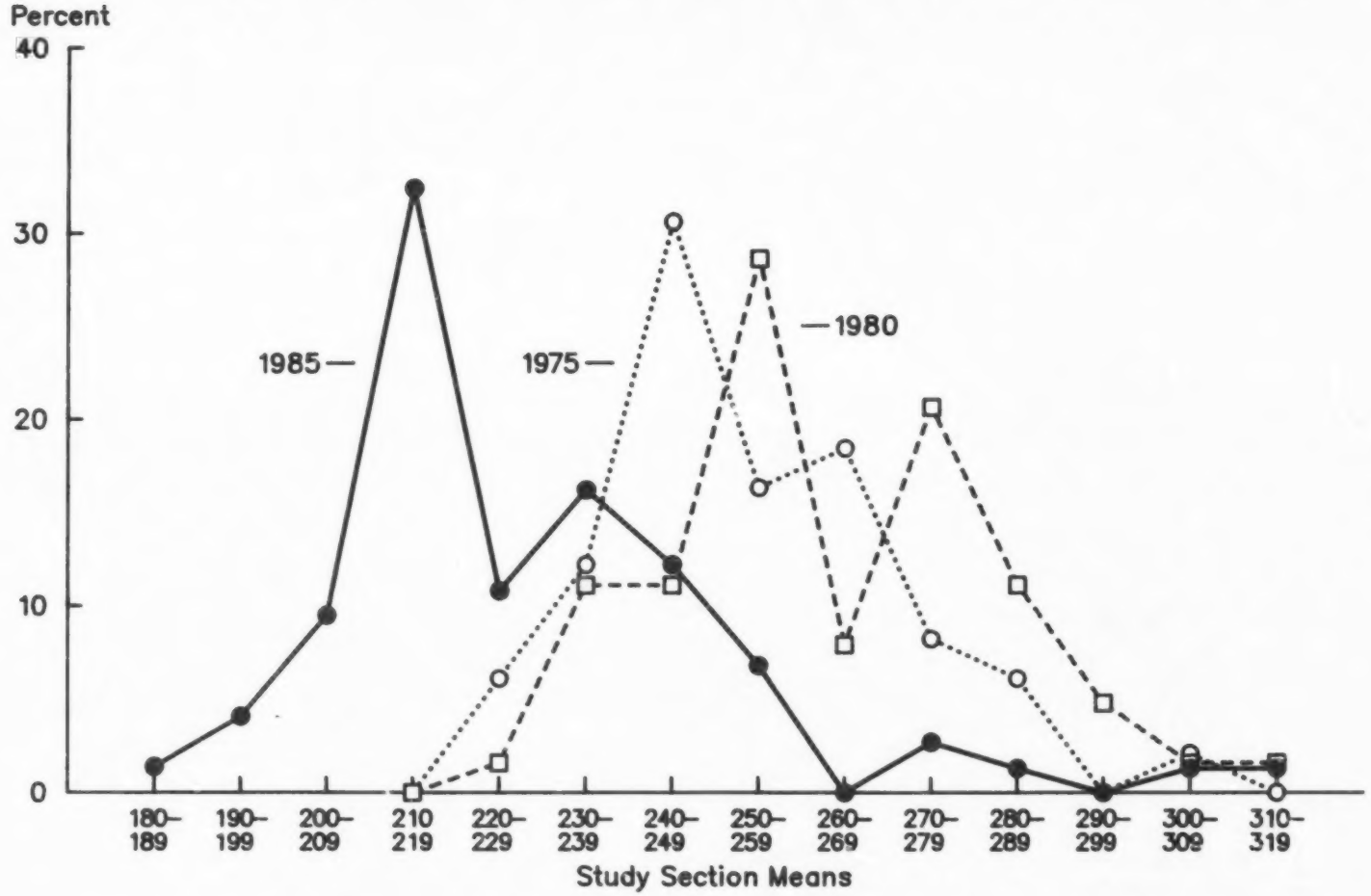
There has been a dramatic rise in the recommended approval of applications by study sections. In 1975, only 8 percent of DRG study sections approved over 90 percent of their R01 applications. This tripled to almost one-fourth of the study sections by 1980 -- and tripled again to three-fourths by 1985. The same factors that contributed to better priority scores also contributed to increased approval rates -- earlier and more complete feedback to applicants on summary statements, better applications resulting from increased competition for funding, and an increase in amended applications.

Applications are disapproved because of serious human subject, animal welfare or biohazard concerns. In addition, disapprovals occur if a majority of study section members think a project is not of sufficient merit to be worthy of support. In the latter group, the line between disapproval vs. recommended approval with a poor score can easily become blurred. Given current paylines, these differences will not alter the funding status of the application in question. However, since percentiles are based on approved applications, the proportion of disapprovals voted by each study section has the potential to affect the percentile rankings of its other approved applications. A similar situation existed when normalized scores were used.

The following distributions of study sections by recommended approval rates are limited to study sections that reviewed 100 or more R01 applications in the indicated year:

Study Section Approval Rates	1975	1980	1985
31 - 50	8.2%	4.8%	-
51 - 60	10.2	3.2	-
61 - 70	28.6	9.5	1.4%
71 - 80	22.4	22.2	2.7
81 - 90	22.4	36.5	21.6
91 - 100	8.2	23.8	74.3
Total	100.0	100.0	100.0
Study Sections:	49	63	74

Percent Distribution of DRG Study Sections by Mean R01 Score Assignments*, FY1975, FY1980, FY1985



*Scores summarized by fiscal year of IRG review. Excludes Special Study Sections; includes all other sections reviewing 100 or more applications in indicated year: 49 in '75, 63 in '80, 74 in '85.
Source: NIH, DRG, Statistics and Analysis Branch

8706-W17

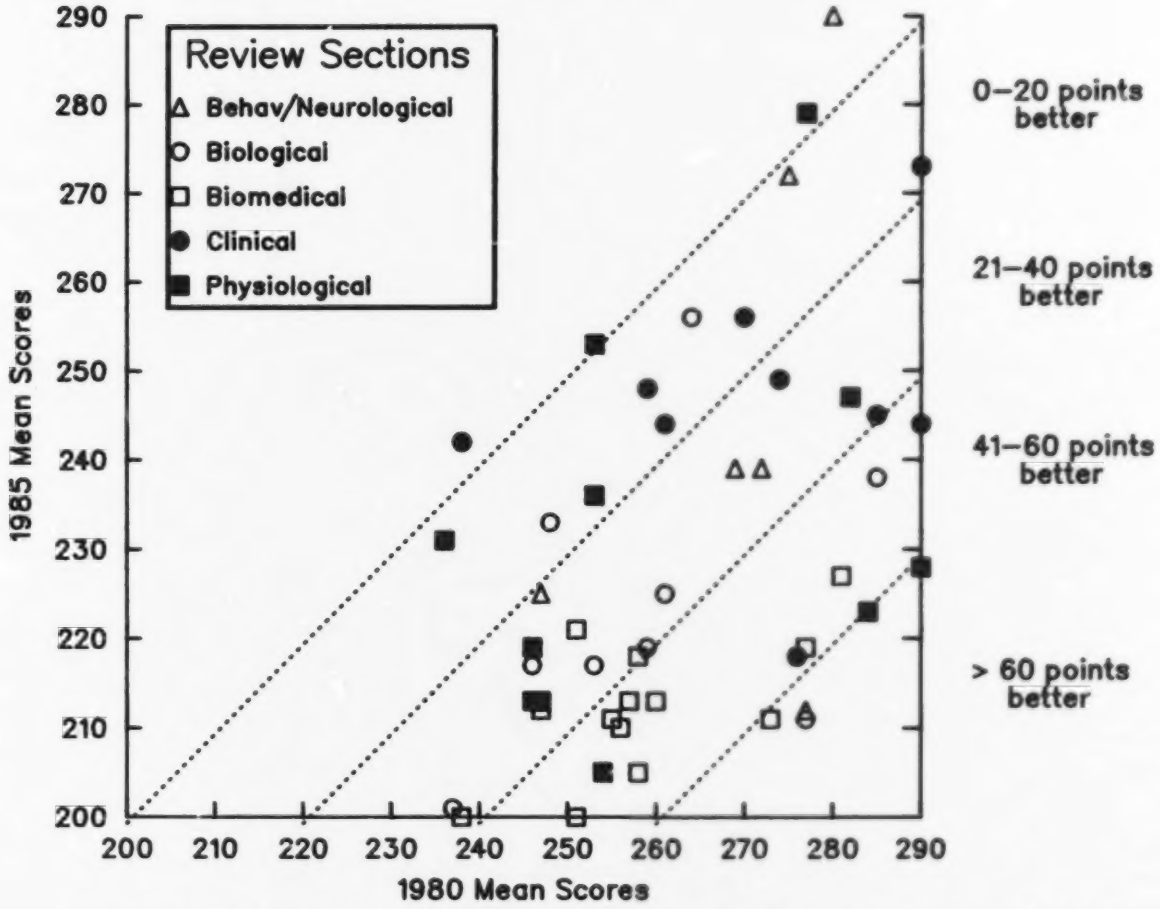
The present distribution of DRG study sections according to their mean scores bears a striking resemblance to that found 10 years ago, except that scores are now about 25 points better (lower). In 1975, almost one-third (31%) of the study sections had means between 240-249; by 1985 almost one-third (32%) had means between 210-219. A similar proportion of study sections had scores better (lower) than these modal values - - 18 percent in 1975 vs. 15 percent in 1985. Each had a somewhat bimodal distribution with a secondary peak of study sections with means about 20 points higher. In 1980, study sections showed a more pronounced bimodal distribution, and overall means higher than both 1975 and 1985. The following comparisons exclude special study sections and are limited to sections which reviewed 100 or more R01 applications in the indicated year.

The distribution of study sections by mean score is as follows:

Study Section Means	1975		1980		1985	
	%	cum %	%	cum %	%	cum %
180 - 189	-		-		1.4	1.4
190 - 199	-		-		4.1	5.5
200 - 209	-		-		9.5	15.0
210 - 219	-		-		32.4	47.4
220 - 229	6.1	6.1	1.6	1.6	10.8	58.2
230 - 239	12.2	18.3	11.1	12.7	16.2	74.4
240 - 249	30.6	48.9	11.1	23.8	12.2	86.6
250 - 259	16.3	65.2	28.6	52.4	6.8	93.4
260 - 269	18.4	83.6	7.9	60.3	0.0	93.4
270 - 279	8.2	91.8	20.6	80.9	2.7	96.1
280 - 289	6.1	97.9	11.1	92.0	1.3	97.4
290 - 299	0.0	97.9	4.7	96.7	0.0	97.4
over 299	2.1	100.0	3.2	100.0	2.6	100.0
Study Sections :	49		63		74	

Perhaps the major change in study section behavior, aside from assigning better scores, is the increased variation in study section means since 1979. This reflects the larger score decline in Biomedical and Biological Review Sections compared to Clinical and Behavioral Sections (page 102). The variation in priority scores among study sections has led to increased use of the percentile rank of an application in assessing its relative merit by the institutes.

Relationship between Mean R01 Score Assignments of 48 DRG Study Sections:* FY1980 vs. FY1985



*Limited to chartered study sections reviewing 100 or more R01 applications in both FY of IRG review 1980 and 1985. Excludes supplements. Mean scores over 290 plotted at 290.
Source: NIH, DRG, Statistics and Analysis Branch

8706–W23

In addition to large differences in priority score means and distributions, study sections also show considerable variation in the amount of improvement that their scores have shown since 1980. The following comparisons are based on the 48 study sections that reviewed 100 or more R01 applications in both 1980 and 1985.

Since 1980, 19 percent of these study sections showed mean score improvement (declines) of 20 points or less, an additional 37 percent averaged declines of from 21 to 40 points while 38 percent declined by more than 40 points (including 10 percent by more than 60 points). Only 6 percent of the study sections had higher (poorer) mean scores in 1985 than in 1980.

Mean Score Change: 80-85	Number	Percent	Cum. Percent
(+) 10 - 1	3	6.3	6.3
(-) 0 - 20	9	18.7	25.0
21 - 40	18	37.5	62.5
41 - 60	13	27.1	89.6
> 60	5	10.4	100.0
Total	48	100.0	

The range of study section mean scores increased from 74 points (236-310) in 1980 to 114 points (201-315) in 1985. Study sections with the poorest mean scores in 1980 (260 or more) showed the largest amount of score improvement by 1985 with 21 percent improving by over 60 points.

Mean Score Change 1980-1985	1980 Study Section Mean: Less than 260	260 or more	Total
(+) 10-1	4.2	8.3	6.3
(-) 0-20	20.8	16.7	18.7
21-40	45.8	29.2	37.5
41-60	29.2	25.0	27.1
> 60	0.0	20.8	10.4
Total	100.0	100.0	100.0
Number	24	24	48